NOVEMBER 1952

WIRE AND WIRE PRODUCTS

VAUGHN® RINGBLOX®

INTERMEDIATE AND *Fine* WIRE

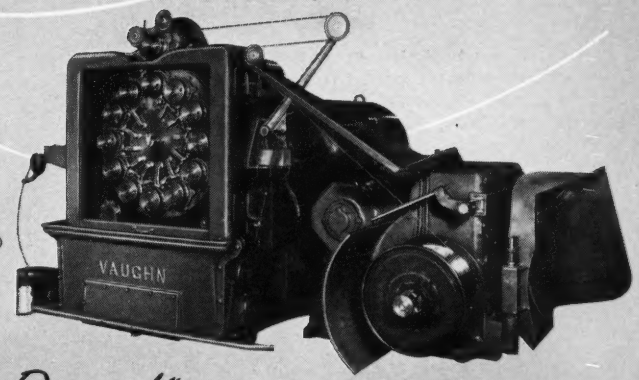
AT HIGH SPEED!

Extremely rapid production of finer to finest sizes of wire in steel, aluminum, copper and their alloys is at your command with Vaughn Ringblox. A great innovation in wire drawing machine design, Vaughn Ringblox serve with outstanding success throughout the industry. *Write for the facts.*

THE VAUGHN MACHINERY CO.

CUYAHOGA FALLS, OHIO, U. S. A.

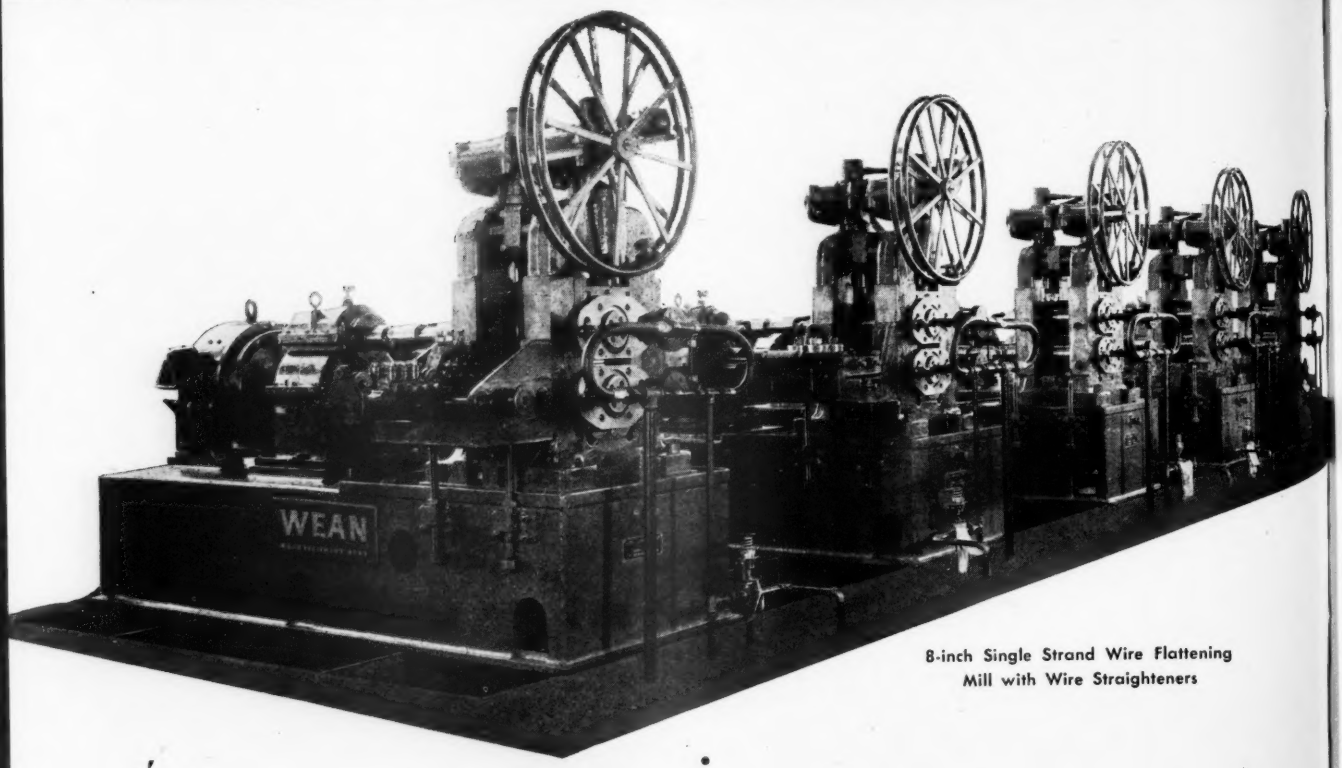
COMPLETE COLD DRAWING EQUIPMENT . . . Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.



"Quick on the Draw!"

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

Wean



8-inch Single Strand Wire Flattening Mill with Wire Straighteners

A COMPLETE ENGINEERING SERVICE FOR WIRE MILL INSTALLATIONS

Complete Installations for Electro Galvanizing, Hot Dip Galvanizing, Patenting, Tinning, Wire Flattening, Nail Galvanizing and Blueing.

Complete Equipment for the Manufacture of Hexagon Netting, Hinge Joint Fence and Barbed Wire.

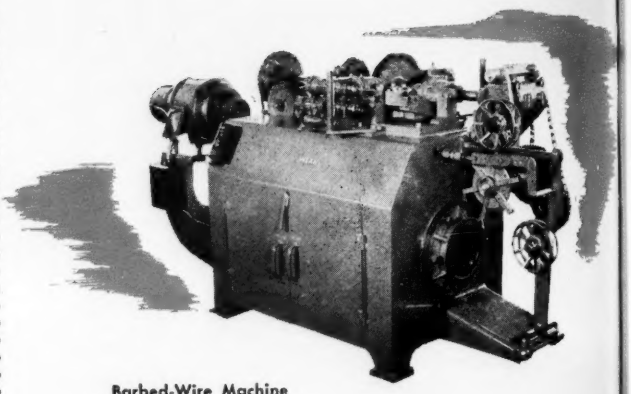
CHECK WEAN FIRST FOR WIRE MILL EQUIPMENT

STRIP MACHINERY

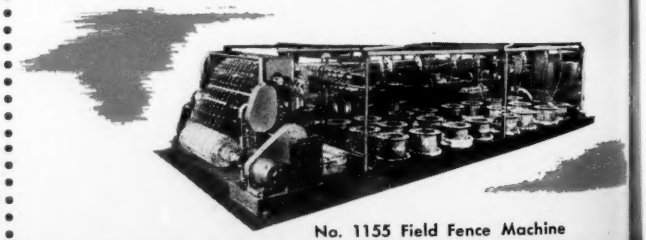
Slitting Installations. Cut to Length Installations. Bearing Metal Coating Installations. Two-Hi Rolling Mill Applications. Strip Grinding Installations. Levelers, Uncoilers, Pinch Rolls, Shears for Strip Processing lines.

WEAN EQUIPMENT CORPORATION

22800 LAKELAND BLVD. • CLEVELAND, OHIO



Barbed-Wire Machine

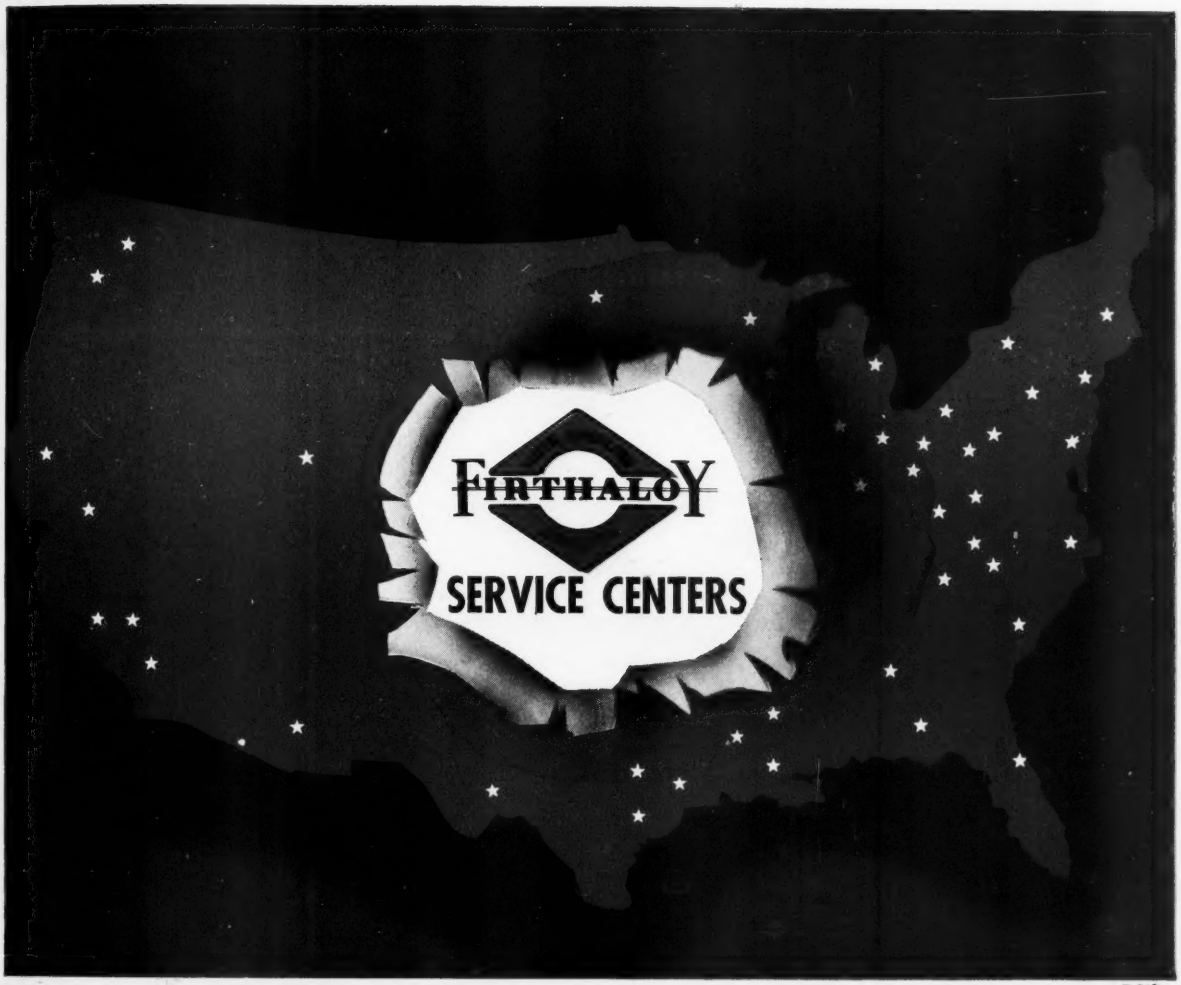


No. 1155 Field Fence Machine

Wean Equipment Corporation

CLEVELAND, OHIO

NOW··
another expansion of **FIRTH SERVICE**



R-268

The Country's Leading Die Makers are Firthaloy Service Centers

The overwhelming demand of American Industry for Firthaloy carbide dies has made it desirable to expand services through a new and closer working relationship with the country's leading diemakers, can assure you faster delivery, better service and lower cost. When you specify Firth Sterling quality carbide, backed by years of diemaking experience for these products.

- Rough Drilled and Finished Die Nibs
- Finished Round Dies
- Finished Shape Dies
- Finished Mandrels and Mandrel Nibs
- Finished Deep Draw and Cartridge Case Dies
- Finished Cold Heading and Extrusion Dies
- Side and End Blocks
- Quills and Cut-Off Knives
- Compacting Dies
- Finished Nail Dies and Cutters

As always Firth Sterling maintains a sales and production engineering service, and development facilities to design, fabricate, and test new carbide products in your plant.

Firth Sterling INC.

OFFICES* AND WAREHOUSES: HARTFORD NEW YORK* DETROIT CLEVELAND DAYTON* PITTSBURGH* CHICAGO BIRMINGHAM* LOS ANGELES PHILADELPHIA*

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

WIRE FOR SAFETY

Every tire on your car has about 200 ft of strong steel wire anchored in its foundation. These two wire circles, built into the bead of the tire, hold the tire on its rim, help it absorb the shocks of high-speed driving.

Tire chains are steel wire, too—used less often, but priceless when you're pulling out of a curb-side ice pack or piloting a slippery highway.

Much of the wire going into and around tires today comes from Bethlehem mills. Tire-bead wire is high-carbon, high-tensile wire. We give it just the right toughness after its reduction by drawing.

With chain wire, we keep in mind manufacturers' forming operations. This wire must be of uniform, high quality to withstand rapid fabrication and a fast, sure butt-weld at every link.

A big part of our job is working closely with wire users, developing the best possible kind of wire for each one of hundreds of different applications. If you're interested in discussing steel wire, we'll gladly arrange for an experienced Bethlehem engineer to visit you.

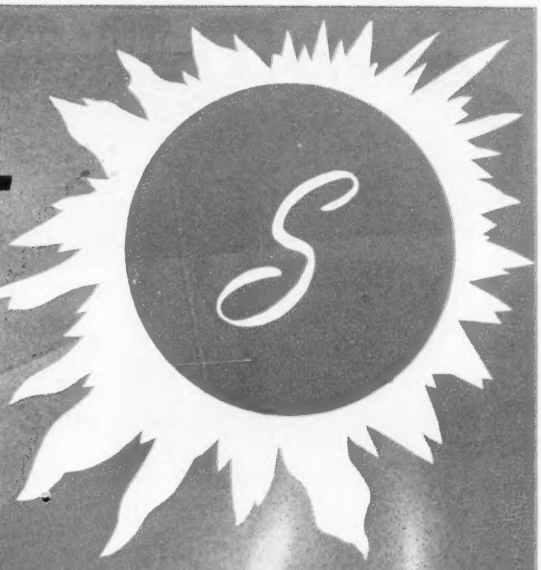
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM WIRE ★ BETHLEHEM STEEL ★

STAYS BRIGHT AS DAY! WITH

STANDARD'S BRIGHT WIRE COMPOUNDS



STANDARD INDUSTRIAL COMPOUNDS COMPANY has pioneered most of the outstanding contributions to better wire drawing through better lubricants. Consult with STANDARD for the solution of your difficult problems. We welcome your inquiries.

FOR DRAWING CLEAN BRIGHT STEEL WIRE

1, 2, 3, 4 and 5 holes

Contact one of our representatives or the home office for the proper compound, depending on the number of holes being drawn.

Bruce W. Siemon
2400 Morrow Pl.
Pittsburgh 34, Pa.

John A. Moritz, Jr.
4600 W. Ferdinand St.
Chicago 44, Ill.

Earl A. Bowers
5536 Lisette
St. Louis, Mo.

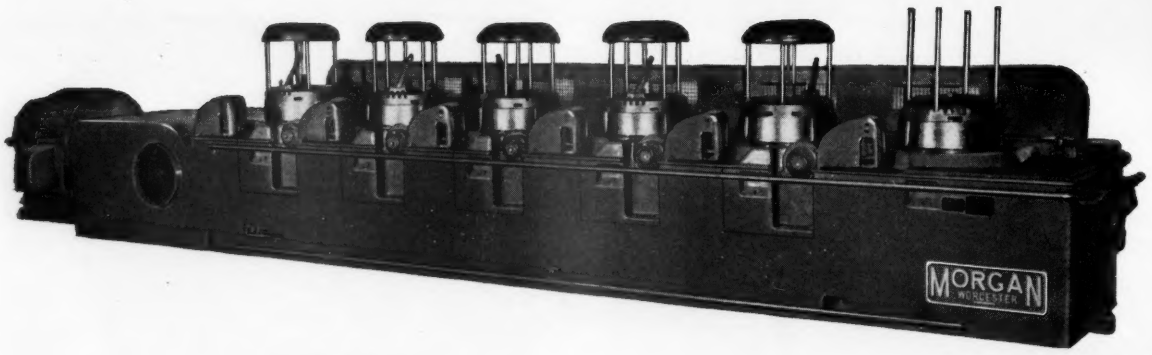
Charles P. Orr
Caledonia Park
Fayetteville, Pa.

Standard Industrial Compounds Co.
Millbury, Mass.
Arthur J. O'Mara

wire drawing lubricants

Standard INDUSTRIAL COMPOUNDS CO., INC.

4600 WEST FERDINAND STREET
CHICAGO 44, ILLINOIS



Make more money

On your wire machines.

Really efficient air cooling

Gives you the ability to draw

All grades of wire at high speeds

CONNOR WIRE MACHINES

ROLLING MILLS
MORGOIL BEARINGS
REGENERATIVE FURNACE CONTROLS
AIR EJECTORS
PRODUCER GAS MACHINES

WM-88

MORGAN CONSTRUCTION COMPANY • WORCESTER, MASSACHUSETTS

WIRE AND WIRE PRODUCTS

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 27 NOVEMBER, 1952 No. 11

Designated as Official Publication By The Wire Association

Contents

Editor's Desk 1171

Non-Ferrous Division Holds First Session in Waterbury
by Edmund D. Sickels 1173

Bunched Copper Wire for Electrical Conductors
by Howard H. Allen 1175

Production of Brass and Copper Wire
by Benjamin H. McGar 1178

What Are the Differences in Wire Drawing Lubricants?
by Leon Salz 1180

Improved Lime Bath Performance by Recirculation
by Jere Y. Heisler 1185

Glass Paper as an Electrical Insulating Material
by Kenneth J. Busse 1188

Government Wire Production Information 1194

Outstanding Personalities of the Wire Industry 1203

A Review of Recent Wire Patents 1211

Index to Advertisers 1240

Where-to-Buy 1241-1244

WIRE and WIRE PRODUCTS is indexed regularly by Engineering Index, Inc., New York, N. Y.

RICHARD E. BROWN, President and Publisher

R. S. Spengel, Secy.-Treas. & Gen'l. Manager
J. Edward Donnellan, Vice-President

Edmund D. Sickels, Editor

— ASSOCIATE EDITORS —
Kenneth B. Lewis, Consulting Wire Mill Engineer
Lancaster, Allwin & Rommel, Consultants on Patent Information

Publication Office: Orange, Conn.
Executive Office: 453 Main St., Stamford, Conn.

*Reg. U. S. Pat. Off.

WIRE & WIRE PRODUCTS, Vol. 27, No. 11, November, 1952. Publication Office at Orange, Conn. Executive Office 453 Main Street, Stamford, Conn. Published monthly by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Sec'y. and Treas. Subscription price: U. S. $5.00; Canada, $5.00 per year; 50 cents per copy, except October Convention Issue and January Convention Proceedings Issue, $1.00 per copy; Foreign $7.50 per year. Entered as second class matter, at the Post Office, Orange, Conn., under the act of March 3, 1879.

Copyright, 1952. Quinn-Brown Publishing Corp.

NILES

FLANGED STEEL TRAVERSES

... eliminate the labor of handling large numbers of small parts ... make it easy to assemble reels in four simple steps.

And, they make up into strong reels that can be used over and over. Actual experience records show as much as sixteen years' service without refinishing or major maintenance, as well as a 50% to 100% increase in the number of trips before cut downs or scrapping of wooden heads.

Niles Flanged Steel Traverses are manufactured in sizes up to 56" diameter and 48" traverse—in plain, painted or hot dip galvanized finish—as light as 18 gauge steel. Width of flange and number of bolt and drain holes are furnished to your specifications. Available for prompt delivery. *Write for prices.*

• • •

Manufactured Under License Arrangements With Western Electric Co., Inc.

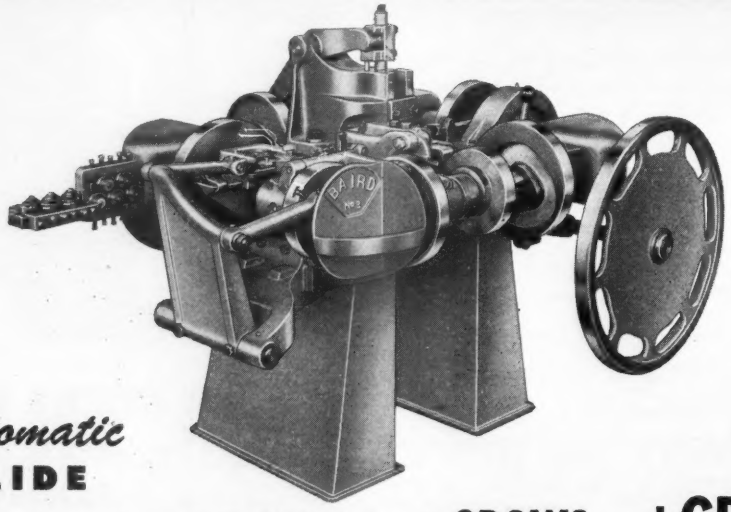
REPUBLIC STEEL

NILES STEEL PRODUCTS DIVISION

REPUBLIC STEEL CORPORATION
NILES • OHIO

ASK **BAIRD** ABOUT IT!

HIGH PRODUCTION TOOLING



BAIRD *Automatic*
FOUR SLIDE

. . . the Machine that GROWS and GROWS and GROWS

Start, if you wish, with the standard (stocked) 4-slide, which in itself is remarkably versatile in forming hundreds of articles from wire and ribbon metal.

Then when conditions demand . . . a call for even greater versatility of production or a change in certain products . . . you may add one or more attachments to the standard model, so designed that "machine growth" is simplified and practical.

Thus, with gradual investments, you will build your Baird 4-slide to a full production unit capable of turning out the widest variety of wire and ribbon products. Here is a list of attachments easily added . . . but naturally, not all on one machine . . . as they might become too complicated.

1 Horizontal Press Attachments

2 Form Raising Attachment

3 Pin Pulling Attachment

4 Round Wire and Ribbon Metal Rings
(Simple, practical tooling available)

5 Secondary Cut-Off Attachment

6 Pinch Pointing — Nail Pointing
(Tooling to suit work and wire specifications)

7 Vertical Forming and Stripping
(New patented Baird mechanism for this work)

Baird engineers will gladly develop tooling from your parts or specification. "Ask Baird about it!"

the **BAIRD MACHINE COMPANY**
STRATFORD • CONNECTICUT

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

48A32

Worried about the Wire Situation?

● Each day, the mobilization program brings new and tougher problems for users of wire.

So *our* biggest job now, as we see it, is to help you solve these problems. And as the world's largest manufacturer of steel wire, we believe we can do it.

On our staff, we've got some of the best metallurgists in the world. They've worked on thousands of wire application problems. And—here's the best part—a problem that is new to you may be old stuff to our engineers. Maybe you're using a wire that's unsuitable for the job it has to do. No matter what your problem, our metallurgists are qualified to recommend the best type of wire for the application, and they are always ready to cooperate with you.

Anyway, if you're having trouble, it doesn't hurt to find out if we can help you.

This offer of free advice and help is nothing new. But we think you'll agree that this is a good time to repeat the offer.

UNITED STATES STEEL COMPANY
AMERICAN STEEL & WIRE DIVISION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN MANUFACTURERS WIRE

AMERFINE—*High-quality fine wire.*

AMERSPRING—*music steel spring wire.*

AMERLOY—*alloy heading wire.*

AMERTEMP—*heavy-duty oil-tempered wire.*

AMERHEAD—*uniform heading wire.*

AMERSTITCH—*extra-tough metal stitching wire.*

U·S·S AMERICAN
MANUFACTURERS WIRE

USS TRADE MARK

UNITED STATES STEEL

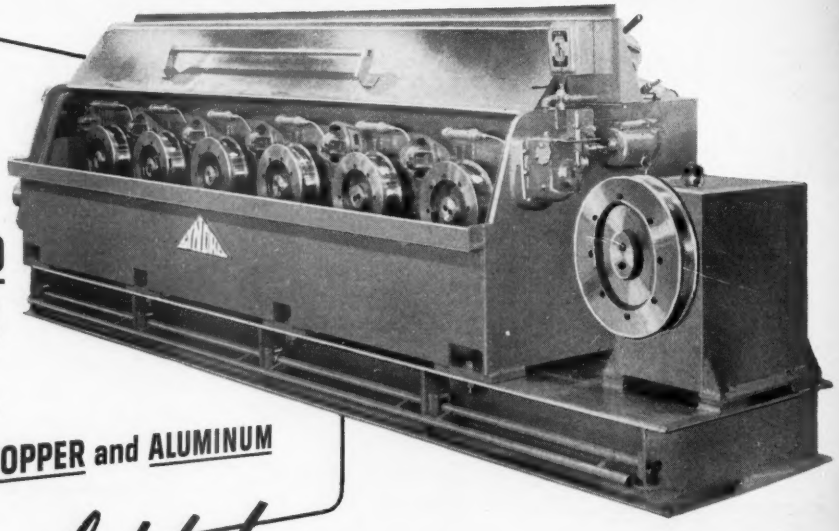
now better your production with . . .

an indisputably *helpful* **improvement**

for faster processing of non-ferrous materials...

A NEW LINE OF HEAVY DUTY TANDEM ROD BREAKDOWN MACHINES...

...especially for COPPER and ALUMINUM



helpful **because** of finishing speeds as high as 5,000 feet per minute and rod size entries as heavy as ½" in soft copper rod

OTHER FEATURES—HIGHLY EFFICIENT BLOCK DRIVES INCORPORATING PRECISION BUILT HERRING-BONE AND CONE WORM GEARS • SAFETY INTERLOCK FORCE FEED LUBRICATION • NEW ADJUSTABLE DIE HOLDERS • TANDEM TYPE ROLLS • HARD WEARING BLOCK SURFACES • PNEUMATICALLY CONTROLLED ONE PIECE COVER ELIMINATING MANUAL OPERATION • SPEED SELECTION POSSIBLE WITH A. C. DRIVE MECHANICAL TRANSMISSIONS OR D. C. DRIVE • BUILT FOR EASE IN STRINGING • FURNISHED WITH 22" COILER BLOCKS AND STRIPPERS IF REQUIRED • AVAILABLE WITH FROM FOUR TO TEN DIE POSITIONS

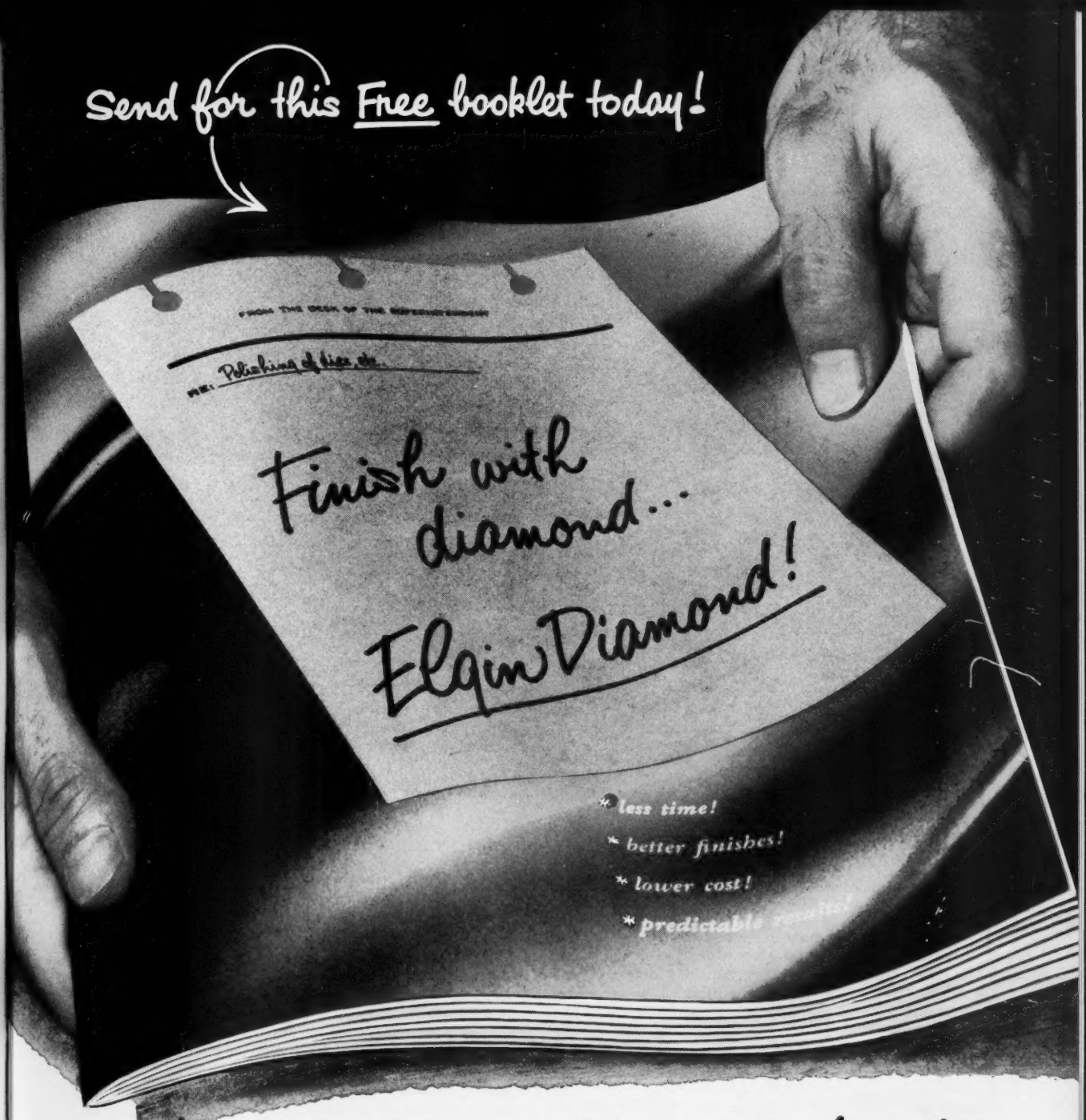
SYNCRO MACHINE COMPANY

Machinery for the Wire Industry

PERTH AMBOY NEW JERSEY

Affiliated Co.
Winget-Syncro,
Rochester, Kent, England

If desired write us for further information—at no obligation, of course



Here's a way to Save Time and Improve Finish Quality

See why diamond is the fastest cutting of all abrasives . . . and why Elgin Diamond is the fastest cutting of all the diamond abrasives. Illustrations and specific data on plastic mold polishing, drawing die finishing, tool and gage lapping and mass production polishing of component parts will help you solve your own finishing problems. Write for your copy now . . . ask for a free demonstration right in your own shop to prove how you will save when you . . .

Finish with Diamond... ELGIN Diamond!

ABRASIVES DIVISION, DEPT. G

ELGIN NATIONAL WATCH COMPANY

ELGIN, ILLINOIS

ELGIN

Why Burn Down Your House for Roast Pig?

IN ancient China, men ate meat raw. But one day, while Ho-ti the swineherd gathered mast for his hogs, his stupid son Bo-bo, playing with fire, burned down their straw hut. Bo-bo sniffed the odor of burnt pig. He touched one to see if it was still alive, scorched his fingers, put them in his mouth and was amazed at the delicious taste. Father came home and caught his son devouring a pig. Ho-ti tried one, too, found it intoxicatingly sweet and satisfying.

Thereafter, neighbors observed feverish building of new straw huts at Ho-ti's, followed always by conflagrations. The secret leaked and fires became widespread. In a few weeks even his Lordship's town house was on fire. Finally, straw for hut building disappeared from the market and young pigs could not be had for love or money. At last, after many generations, a wise man arose who said that a pig could be roasted without burning down an entire house.

Thousands of years later, we Americans feast deliriously on "roast pig." Accompanying our delights are fires of inflation, which can destroy our values just as certainly as the roasting of Ho-ti's pigs consumed his earthly possessions. But surely we need not await the coming of a sage to tell us not to burn down our houses to enjoy the delights of roast pig!

Let us unite to stop the ruinous flames of inflation. Curb wasteful and unnecessary government spending. Balance our Federal budget. Control our national debt and reduce taxes. Only in this sane way can we produce more straw and enjoy our houses, raise more pigs and eat them, too.

QUALITY V YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

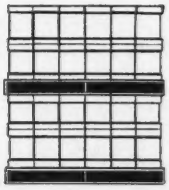
RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

When you ship nails—ship safely in

INTERNATIONAL'S keg-it

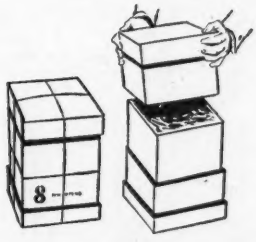
The square container tried, proved, and adopted by many of the largest nail manufacturers

This new modern fibreboard package for nails didn't come about by accident. Over three years of research and thousands of shipments proved it to be the safe, sturdy container with many economical advantages. We would like to tell you more about it, how easily it will fit into your operation. Write us for the complete story.



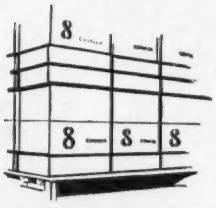
STACK IT

...Saves up to 30% of warehouse space. Readily palletized for unit load handling.



SEAL IT

...Replaceable top protects nails from dirt and weather.



STAMP IT

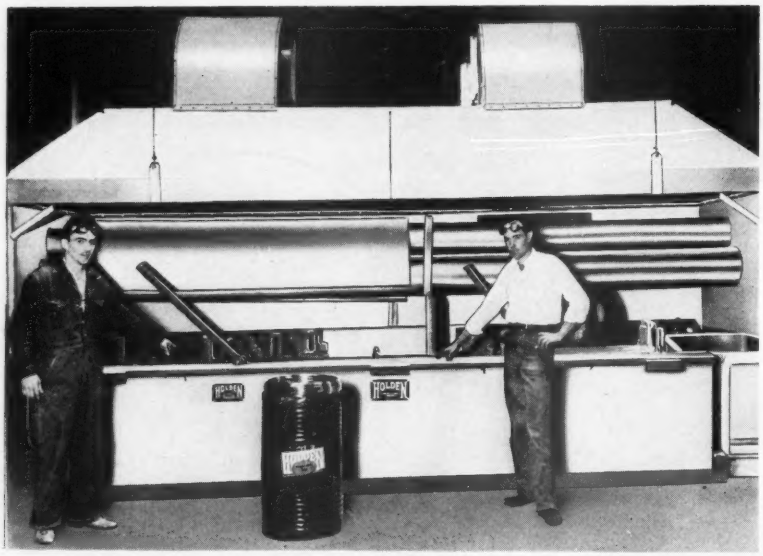
...Quick, easy side marking aids identification, speeds inventories.

International Paper company

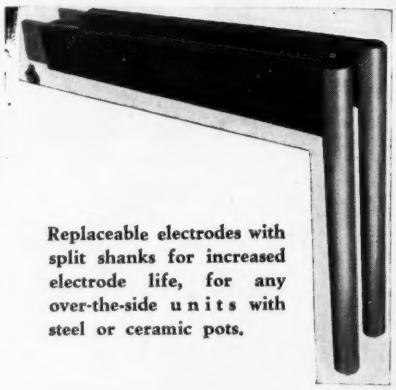
CONTAINER DIVISION

220 East 42nd Street, New York 17, N. Y.

HOLDEN FURNACES AND SALT BATHS



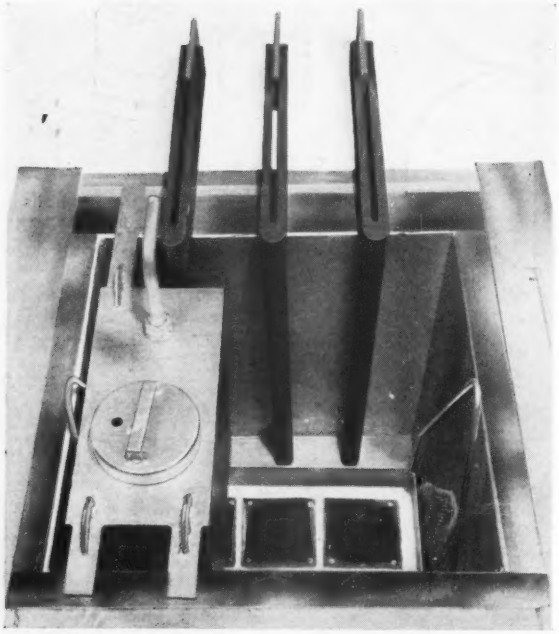
Strand Annealing Furnace for wire to produce bright finish.
For steel and alloy wires.
Process: Annealing or wire patenting.



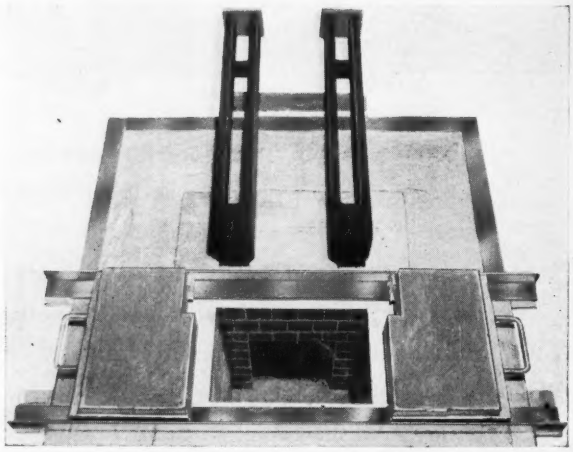
Replaceable electrodes with split shanks for increased electrode life, for any over-the-side units with steel or ceramic pots.

GUARANTEE:

HOLDEN Salt Baths are *guaranteed* in any type of furnace using steel, alloy or ceramic pots. We will assume manufacturer's guarantee in proven designs.



Small Sodium Hydride Furnace for experimental work on small wire coils—built in sizes from 36" by 36" by 36" to 20' long x 5' deep.



Submerged Electrode Furnace with replaceable electrodes. Built in sizes from 12' long x 8" wide x 28" deep to 20' long x 3' wide x 6' deep.

THE A. F. HOLDEN COMPANY

P. O. Box 1898
New Haven 8, Conn.

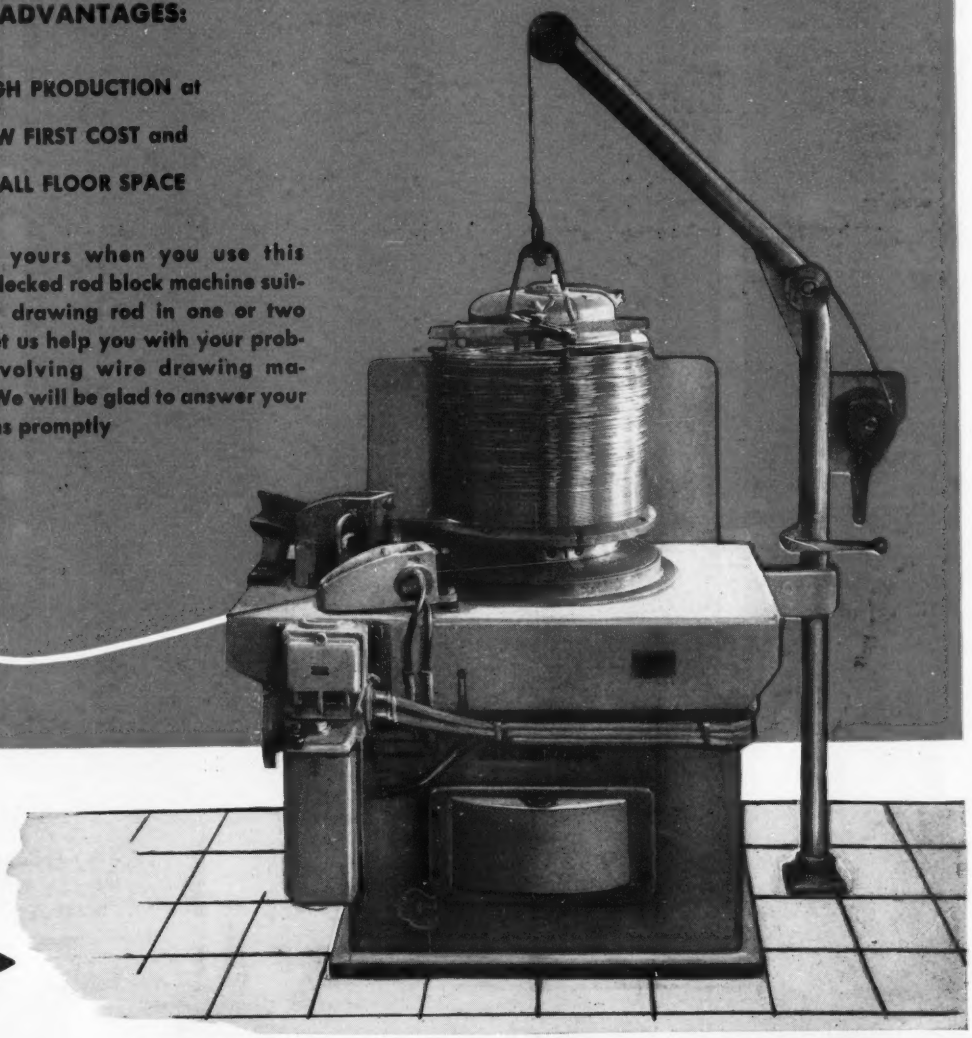
11300 Schaefer Highway
Detroit 27, Michigan

Wire drawing machines

THREE ADVANTAGES:

1 HIGH PRODUCTION at
2 LOW FIRST COST and
3 SMALL FLOOR SPACE

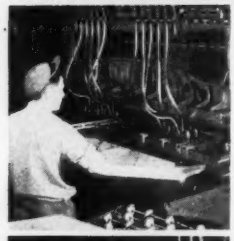
will be yours when you use this double-decked rod block machine suitable for drawing rod in one or two steps. Let us help you with your problems involving wire drawing machines. We will be glad to answer your questions promptly

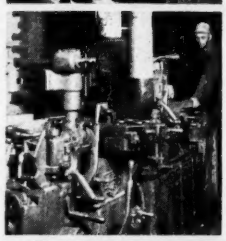


MH

MORGÅRDSHAMMAR

MORGÅRDSHAMMARS MEK. VERKSTADS AB · MORGÅRDSHAMMAR · SWEDEN





ARE YOUR REELS PRODUCED ON A FAST-MOVING PRODUCTION LINE ?

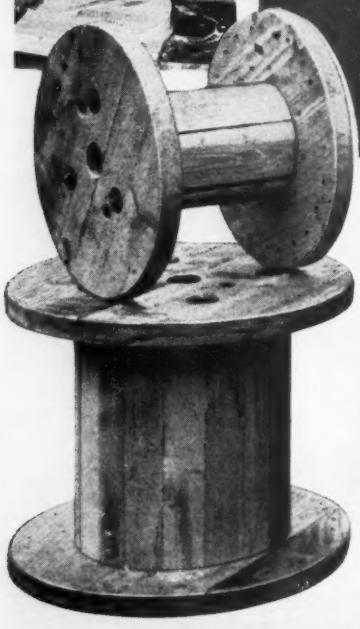
The Bridge plant for manufacturing wood reels for ROPE, CABLE and WIRE is the last word in streamlined production. All work flows in one continuous line through modern, precision equipment, to make the finest, precision-made reels that can be produced at the lowest possible cost.

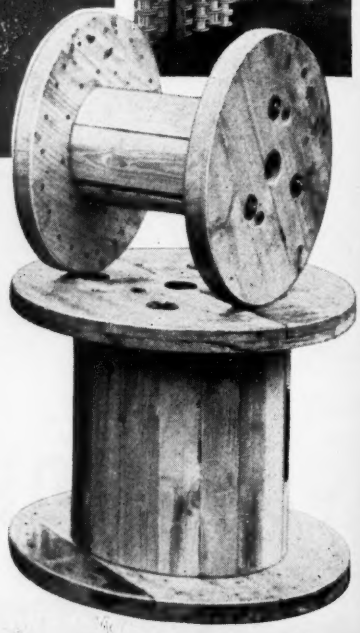
The operations depicted, as shown in side pictures, are:

Forming Flanges	Trucking
Nailing	Painting
Boring	Drying
Band Sawing	Moulding
Assembling	

Bridge reels are made to your specification by straight line production methods. Rapid tooling set-up makes it possible to produce your order efficiently. We make nothing but reels and can do that job to your complete satisfaction.

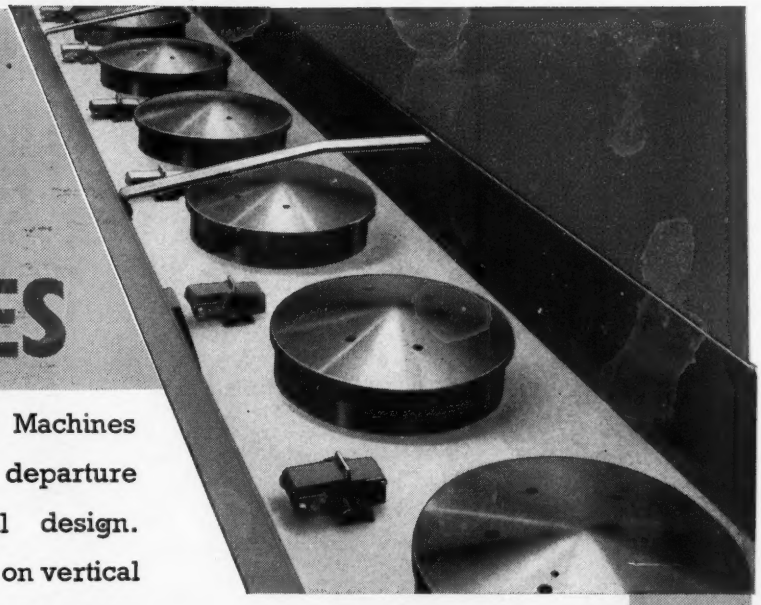
The Bridge distribution service is unequalled. Deliveries to points like St. Louis in 4 or 5 days. Truck deliveries to your door to points 200 miles from Hazardville. Overnight, if urgent.





BRIDGE
MANUFACTURING CO.
HAZARDVILLE, CONN.
Phone Thompsonville, 3375

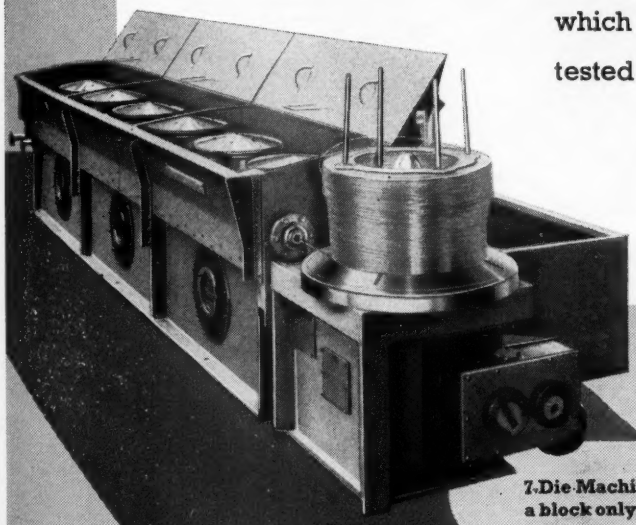
TANDEM ROD MACHINES



Our Tandem Rod Machines are a complete departure from conventional design. Drums are carried on vertical shafts and are totally submerged, with the dies, in the drawing lubricant.

A view inside the drawing bath showing total submersion of the drums and dies when in operation.

As usual, we offer machines which have been thoroughly tested IN PRODUCTION. Every detail in design which assists lowering of costs and raising of output has been embodied.



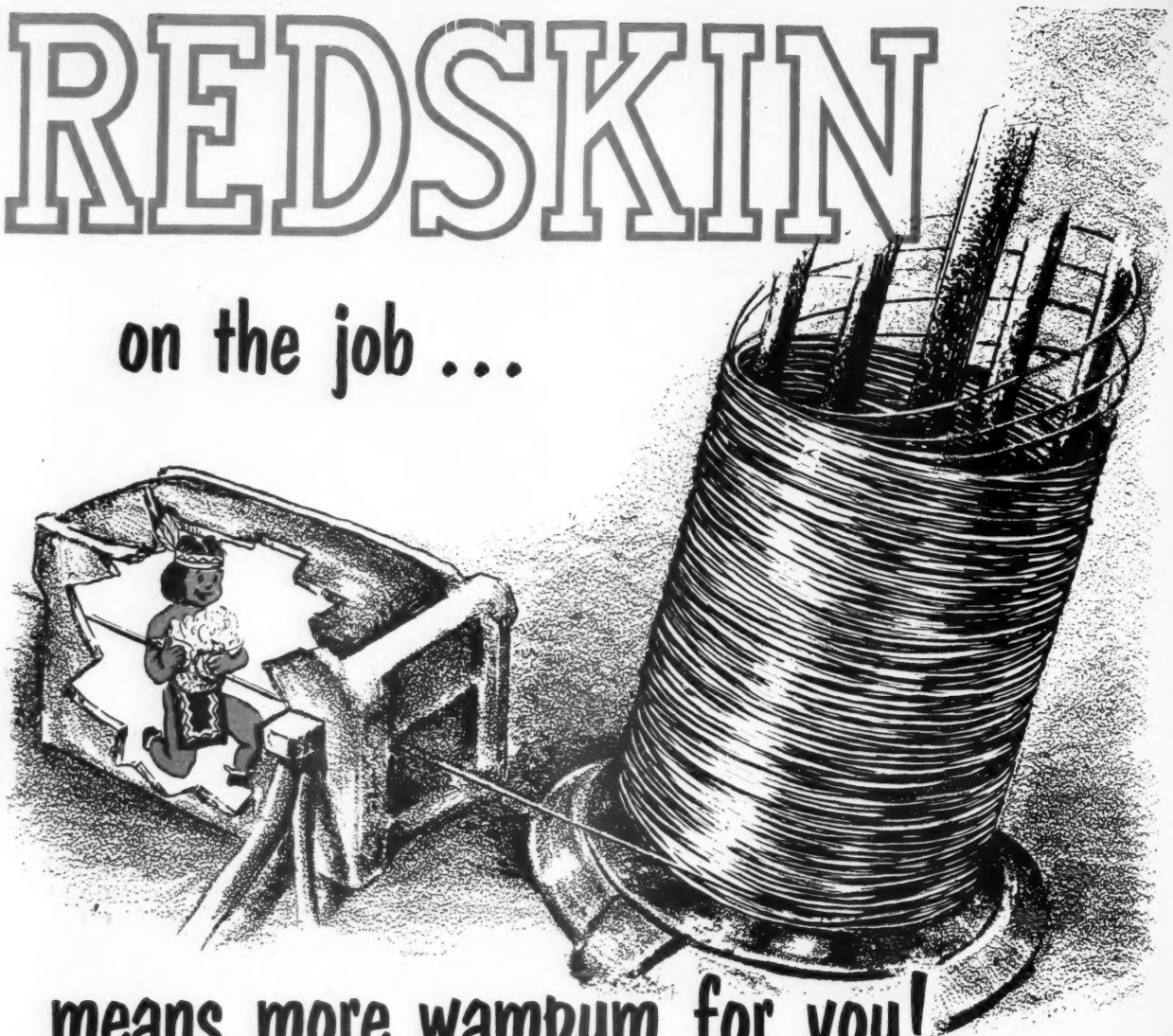
7-Die Machine finishing on a block only—18" diameter

MARSHALL RICHARDS MACHINE CO. INC.

1100 SOUTH BROAD STREET · TRENTON 10 · NEW JERSEY
TELEPHONE: TRENTON 9478 · TELEGRAMS: MARICH TRENTON

REDSKIN

on the job . . .



means more wampum for you!

- ***Lower cost insures substantial savings.***
- ***Gives improved die-life at increased speeds.***

What's more, Redskin uniformity and quality are guaranteed — and Redskin copper coating *requires no electricity, no special equipment* since it's a single chemical which dissolves instantaneously.

Investigate the advantages of using Redskin in your plant. Write TODAY for complete information.

Copper Coat your wire with Redskin

Steelskin LUBRICANTS

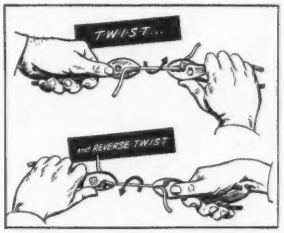
R. H. MILLER
Company, Inc., Homer 1, N. Y.

CHASE® WIRE gets a "physical" to make your products better

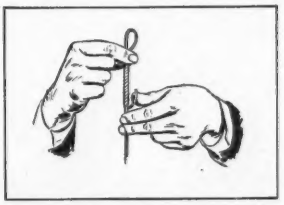
Chase wire is carefully inspected and tested to catch any defect.

In addition to the usual tensile strength tests, it is tested for slivers or any other physical or surface defect not possible to detect by visual inspection.

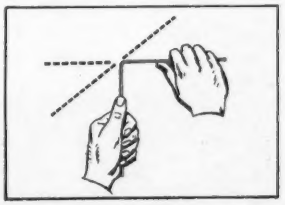
Because of the high ductility and malleability of Chase wire, it is superior for cold-heading, drawing, forming, shearing and many other operations. Chase brass wire is available in a wide range of color from copper red to golden color.



TEST NO. 1. Chase wire is twisted ten times in each direction to reveal seams, slivers, as well as other irregularities.



TEST NO. 2. Only wire of the very highest quality can pass this exacting 360 degree wrap-around test for forming.



TEST NO. 3. Chase wire is bent sharply at right angles in four different directions to reveal possible brittle condition.

Chase® BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

• *The Nation's Headquarters for Brass & Copper*

Albany†	Cleveland	Kansas City, Mo.	New York	San Francisco
Atlanta	Dallas	Los Angeles	Philadelphia	Seattle
Baltimore	Denver†	Milwaukee	Pittsburgh	Waterbury
Boston	Detroit	Minneapolis	Providence	
Chicago	Houston†	Newark	Rochester†	(†sales office only)
Cincinnati	Indianapolis	New Orleans	St. Louis	

IF YOU PRODUCE OR PROCESS

ferrous or non-ferrous

BARS · RODS · WIRE or TUBES

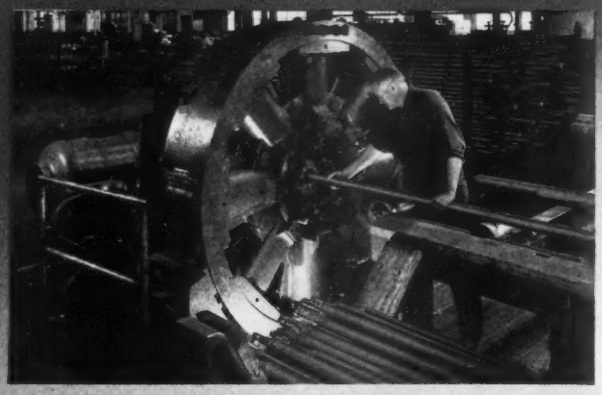
you need —

aetna-standard

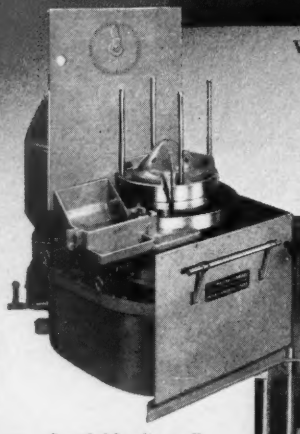
Cold Drawing Equipment

Wire drawing machines, single draft or multi-draft

Available die pull capacities: 2,000 lbs., 4,000 lbs., 8,000 lbs., 16,000 lbs.

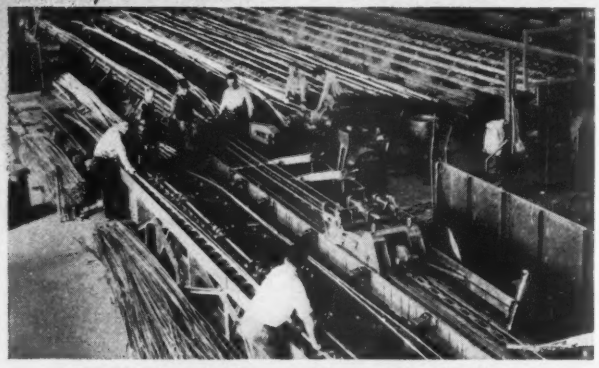


Hydraulic squeeze pointer—available capacities: 300, 600 and 1,200 tons.



Available die pull capacities: 20,000 lbs., to 40,000 lbs.

Bull blocks for rod or tube drawing.



Drawbenches—for bars or tubes; single, double or triple draw; die pull capacities to 300,000 lbs.

The last 10 years have been a period of continuous advance in cold drawing. Most of the design and mechanical improvements introduced in this period originated with Aetna-Standard.

Here, for example, are some of the outstanding achievements of Aetna-Standard: the one-man drawbench; drawbenches for triple drawing of tubes; hydraulic squeeze pointer; horizontal bull block; high speed piercing mills; wire drawing machines utilizing vertical unit construction and auto-rheostatic control.

All of these have originated in the research and engineering departments of Aetna-Standard.

Aetna-Standard

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio · Ellwood City, Pennsylvania

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England—Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y.—Mexico, Central and South America.

Societe de Constructions de Montbard, Paris, France—France, Belgium, Holland, Luxembourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany—Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy—Italy.

Aetna-Japan Company, Ltd., Tokyo, Japan—Japan.

Hale & Kullgren, Inc., Akron, Ohio—Representative for the Rubber Industry.

Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

for economy in coiling,
knotting, forming —

use **Pittsburgh**

Oil Tempered
SPRING WIRE

Day after day, in plant after plant Pittsburgh Oil Tempered Spring Wire is proving that it has the acceptance of production managers and machine operators alike. They find it has the uniform size accuracy and ductility to work smoothly in coiling, knotting, and forming machines. This reduces time; keeps production records climbing. That is why it pays to specify Pittsburgh Oil Tempered Spring Wire. It has the quality, proved in use that gives you economical production runs. For information write Department WWP, Grant Building, Pittsburgh 30, Pa.

Pittsburgh Wire

657b

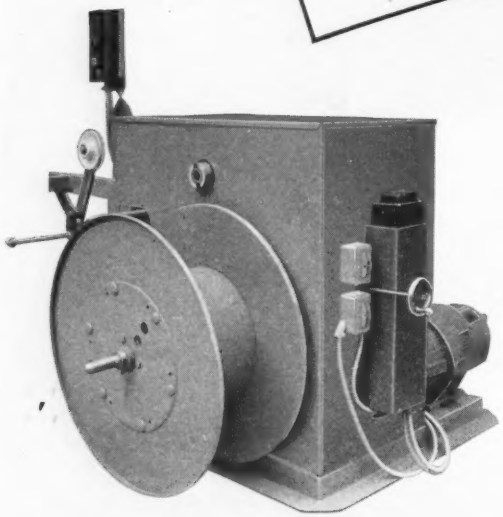
A product of **PITTSBURGH STEEL COMPANY**

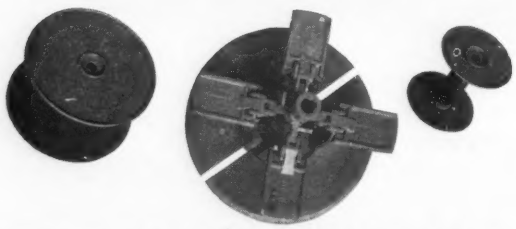
Now!

INTRODUCING

THE COMBINATION MACHINE LONG AWAITED BY THE WIRE INDUSTRY —ELECTRONICALLY CONTROLLED—

THE
DAVIS REELER AND RE-SPOOLER





THE NEW DAVIS REELER AND RE-SPOOLER

is equipped with a Davis predetermined counter for recording production. Stops automatically at any selected footage. A tachometer can also be furnished to indicate speeds.

This new combination machine, designed and developed as a result of Davis engineering research, is the last word in efficient and economical production. Of all welded steel construction, the combination is rugged, precision made and vibrationless.

Designed for use with the completely automatic DAVIS SPARK TESTING EQUIPMENT with your tinning or other present equipment. Adapted for use with any type collapsible coiling head up to 30″ diam.

EXCLUSIVE DESIGN FEATURES

1. Top re-spooling shaft is interchangeable to accomodate $\frac{5}{8}$″ up to $1\frac{1}{2}$″ diameter shafts—or to your specifications. Reel diameter 2″ to 18″. **Shafts can be interchanged in a matter of seconds.**
2. Lower or take-up shaft is also interchangeable. Sizes are standard—$1\frac{1}{4}$″ or $1\frac{1}{2}$″ diam.—or as you may specify. Reels up to 30″ diameter accomodated on this shaft.
3. Traverse, with variable speed control for all wire sizes, syncronizes with shaft speeds. Traverse width adjustable up to 16″.
4. Constant wire winding speeds over a 10—1 range. Maximum speed, 1200 FPM, but higher speeds available. Speed changes easily made through accessible controls.
5. New ELECTRONIC CONTROLLER starts machine with low torque factor. Avoids stretching and/or breaking of wire.
6. Electric disc brake of 10 to 25 lbs. will be furnished according to your requirements.
7. Safety cap provided for the idler shaft.
8. Constant footage device supplied if desired.

You are invited to get the facts on this remarkable machine

DAVIS EQUIPMENT

DAVIS ELECTRIC CO. WALLINGFORD, CONN., U.S.A.

HARNESS TESTERS • PAY-OFFS • TRAVERSES

SPARK TESTERS • SPOOLERS • TAKE-UPS • CAPSTANS

FLAT SPRING STEEL

You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.

For the FINEST Dies...

Specify

DIES... TOOLS... WEAR PARTS... BLANKS...

TELEPHONES: FACTORY and BRANCHES

BIRMINGHAM, ALA. 6-6879	DALLAS, TEXAS Division 4628	KALAMAZOO, MICH. Kalamazoo 3-4294	MINNEAPOLIS, MINN. Bridgeport 3792	PITTSBURGH, PA. Hiland 1-8545	SAN FRANCISCO, CAL. Yukon 6-4869
BOSTON, MASS. Ellsworth 9-4650	DENVER, COLO. Cedar 6444	KANSAS CITY, MO. Baltimore 1700	MOLINE, ILL. Moline 3821	PORTLAND, ORE. ATwater 960	SCRANTON, PA. Springbrook 1-4581
BUFFALO, N. Y. Amherst 2826	DETROIT, MICH. University 4-6400	LIGONIER, IND. 414	NEWARK, N. J. Mitchell 2-8522	READING, PA. Enterprise 1-0959	SEATTLE, WASH. Seneca 0458
CHICAGO, ILL. National 2-2626	HARTFORD, CONN. 22-2197	LOS ANGELES, CAL. LOgan 5-9811	NEW YORK, N. Y. Murray Hill 3-0291	ROCKFORD, ILL. Enterprise 2594	SYRACUSE, N. Y. Enterprise 9266
CINCINNATI, OHIO Redwood 2832	HOUSTON, TEXAS CHarter 4851	LOUISVILLE, KY. Taylor 5948	ORISKANY, N. Y. Utica 6-1998	SAGINAW, MICH. 4-3264	WAUKEGAN, ILL. Ontario 0220
CLEVELAND, OHIO CHerry 1-6277	INDIANAPOLIS, IND. Plaza 3946	MILWAUKEE, WISC. Division 2-0204	PHILADELPHIA, PA. TEnnessee 9-5478	ST. LOUIS, MO. Mission 0113	YORK, PA. Enterprise 9948

IN CANADA: (TOOLS) CARBIDE TOOL CO. W. Toronto 9, Ont. (DIES) VASCARB TOOL & DIE CO. Hamilton, Ont.

The Wire Outlook

Most economic observers are predicting an end to boom levels of business late in 1953 and extending possibly through the two following years. No one expects a "bust", however, because certain conditions not present in 1929 will function to prevent bad downturn. These cushions are construction, unemployment insurance, farm price supports and a controlled national credit policy.

In the meanwhile, with steel production soaring to record highs and its corresponding stimulus to our economy, general business activity has reached the previous all-time peak of April, 1951. Coal output, electric power consumption and freight car loadings are all indicative of the high levels of industrial production.

Tax reductions, when they come, should also spur business, as they will release a tremendous buying power both on the part of industry and the consuming public. This will be good for the national treasury and for sales volumes in all lines. The trend toward inflation appears to be ending, with mild deflation coming toward the end of next year. In this last quarter, price increases are expected not to average more than 1%.

Those who have been depending on steadily rising defense expenditures for prosperity, should now recast their plans to contemplate a more normal civilian economy. While defense spending will remain high this year and next, it is unlikely to continue indefinitely, particularly if the electorate decides upon a house-cleaning in Washington.

One of the weak spots in the business picture is our steadily declining exports. These are at the lowest level in a year and a half. Our imports have also fallen, although not to the same degree. The high prices of domestic products, which are often superior in quality, is making it more difficult to sell abroad, whereas lower prices on foreign goods, notably mechanical equipment, has established a market of sorts here for many foreign items. We had occasion recently to check on who might be making stainless steel wire wrist-watch bands and found that domestic producers had discontinued their manufacture because of the low prices offered by Japanese concerns.

Anti-substitution campaigns are now current. With a better supply of copper, the copper wire people are endeavoring to regain their losses to aluminum. Lead and zinc producers are trying to checkmate substitutions made during the period of shortage and high prices. Stockpiling by the government, of course, prevents users of most metals from getting all that may be wanted, but even this factor will be of diminishing importance as new production facilities come into being.

Fastener demand runs high and producers are struggling to replenish inventories that were cleaned out during the steel strike. Pressure for wire is heavy now, but does not extend past the first quarter of the coming year. Demand for many high carbon specialties, like cord wire, rope wire and others has been moderate, and definite sales pressure is being put on them. Calls generally are for the heavier gauges of wire. Fine wire is moving well, but is in better supply.

The basic reason for materials shortages, apart from stock-piling, is soaring demand. In 1950 we took out of the ground 2½ times more coal than in 1900, 3 times more copper, 4 times more zinc and 30 times more crude oil. In 1950 our country consumed 2.7 billion tons of materials of all kinds. With only 10% of the world's free population and 8% of its land area, we consumed more than half of the materials produced for the free segments of society. Our growing demands are the result of better production techniques, higher standards of living and increasing population.

This trend will continue—provided we remain a democracy!

—from the Editor's Desk

"CATERPULLER"

A CATERPILLAR-TYPE PULL-OUT FOR STRANDERS, CABLERS, ETC.

Introducing an improved method of pulling cable that eliminates Capstan Wheels.

OUTSTANDING FEATURES

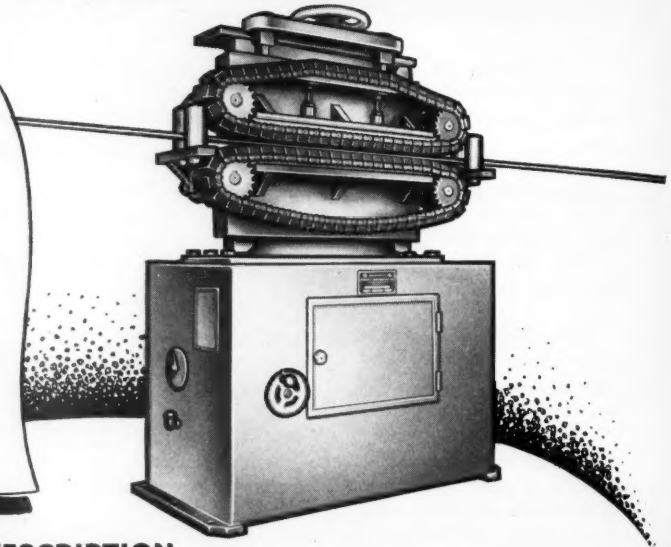
Replaces any capstan equipment.

Does not bend or damage cable.

Considerably reduces required floor space.

Friction is eliminated because pressure on pulling treads is taken up by rolling action.

Extremely rugged and completely enclosed construction.



DESCRIPTION

Horizontal pull is imparted to the cable as it passes between two caterpillar treads consisting of a series of individual blocks - - moulded of tough, resilient, synthetic tire-stock material.

Both upper and lower treads are power driven by dual-roller chain and sprocket construction from a common drive shaft.

Treads are easily adjustable vertically by means of a hand crank to accommodate the full range of cable diameters. This adjustment also determines the clamping effect on the cable and consequently the available pull.

ASK for CAT. SEC. 16A

(See Page 1209 for a complete listing of JLE Products for the Insulated and Bare Wire Industry)

JAMES L. ENTWISTLE CO.

1475 ELMWOOD AVE. PROVIDENCE 7, RHODE ISLAND, U. S. A.

European & South American Agents:
M. CASTELLVI, INC.
150 BROADWAY, NEW YORK 38, NEW YORK

British Associate:
GENERAL ENGINEERING CO., LTD.
BURY ROAD, RADCLIFFE, LANCS., ENGLAND

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 27 November, 1952 No. 11

Non-Ferrous Division Holds First Session in Waterbury

by Edmund D. Sickels, Editor
Wire and Wire Products
Stamford, Conn.

Although non-ferrous bare wire and electric wire and cable men have been having more and more attention paid to their interests in recent years, 1952 will be remembered as the first time in the history of the Wire Association in which a regularly organized division was set up specifically to serve these interests.

★ ★ ★

Starting last October at our informal meeting during the Annual Convention in Chicago, a conference was called in Stamford in the spring to form committees and organize plans for a meeting program. This resulted in a Regional Meeting of this new division on September 19, 1952, in Waterbury, Connecticut at the Elton Hotel, which was most encouraging from the standpoint of attendance and the general interest and enthusiasm evidenced.

★ ★ ★

The program, which started at 10:30 a.m., included two technical papers and a visit to the Chase Brass and Copper Company's Metal Works in the afternoon, and was climaxed in the evening by a dinner, at which the principal speaker was Chauncey P. Goss, Vice President in Charge of Mill Sales of the Scovill Manufacturing Company.

★ ★ ★

The first technical paper was presented by Benjamin H. McGar, Director, Metallurgical Department for Chase, who talked on brasses, their properties, processing and applications. At the close of his talk he proposed that at a future meeting a symposium be set up, comprised of both producers and users of cartridge and yellow brass, to uncover ways and means of developing brasses with qualities that users want. ★ ★ ★

Following him, Howard H. Allen, President of the Nonotuck Manufacturing Company of Holyoke, discussed some of the problems attendant upon the manufacture of bunched copper wires for electrical conductors, making at the same time a stirring appeal for the unification of government and commercial standards, to simplify the problems of the manufacturer. As a result of this plea, action was taken to form a committee to deal with the problem. Richard E. Brown, Executive Secretary of the Association, was called into the discussion, and took the opportunity to explain the purposes and workings of the Association for the benefit of those there who were not members, inviting them to join the society and to participate in its work.

William L. Wells, General Program Chairman, opened the meeting, expressing regret that the visit to his company's plant, Scovill Manufacturing Company, had to be cancelled because of the strike and voicing his appreciation of the Chase Company's kindness in opening their Metal Works at Waterville to the group. It was pointed out also that this meeting coincided with the 150th anniversary of the establishment of the brass industry in Waterbury. ★ ★ ★

James E. Flood, Plastic Wire and Cable Company's Chemical Engineer, served as Meeting Chairman, introducing the speakers and leading the discussions.

★ ★ ★

Busses took the people out to the Chase Metal Works starting at one o'clock, where they were guided by technical men through the huge plant to see casting, strip rolling, extrusion, tube forming and drawing, rod rolling, wire drawing, cleaning and heat treating operations. In spite of the great size of the mills, there is not a square foot that is not occupied by equipment, except for the aisles, in which material handling trucks were constantly moving about. All operations are on a large scale and visitors were much pleased to be able to see this fine Chase mill. A memento of the occasion was a handsome boolket entitled "My Trip Through the Chase Metal Works," provided by the management for each guest.

★ ★ ★

A well-attended cocktail hour preceded dinner, made possible by the generosity of several of the suppliers present who under the informal chairmanship of Leroy D. Seymour,

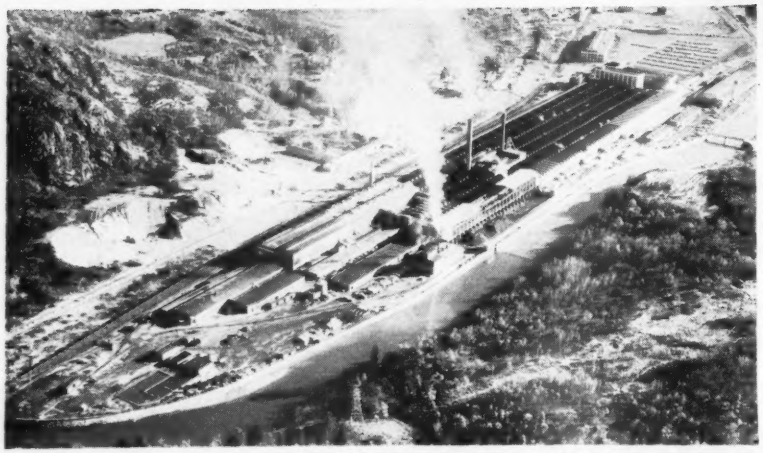


Fig. 1—Aerial view of the Chase Metal Works Plant * * * * * * *

Marshall Richards Machine Company, Inc., Trenton, N. J., contributed generously to make this hour a socially satisfactory success.

★ ★ ★

After the dinner paraphernalia had been cleared away and Bill Wells had expressed his appreciation to his committeemen, and especially to Mrs. Ruth S. Spengel for her part in making hotel and dinner arrangements, he introduced Leonard C. (Red) Crewe, Jr., who welcomed the group as Acting President of The Wire Association. Red apologized wittily for being perhaps the only steel man present. He is president of the Maryland Fine and Specialty Wire Company. Bill then introduced the principal speaker, Chauncey P. Goss, who commented on the copper and brass supply situation, expressed his feeling that the day of selling and keen competition was not far away and gave pointers to those who would have to organize themselves for competitive selling.

★ ★ ★

He noted that the Chamber of Commerce had stated recently "that direct military shipments amounted to 31.7 per cent of all brass mill products delivered during the second quarter of this year. If war doesn't come, the major defense spending is supposed to decrease sharply by 1954. That will mean that to keep running at our present rate, the civilian consumer economy has got to take up the slack in production caused by the cut-down in defense spending."

★ ★ ★

Mr. Goss said that the Government has been advising brass and copper users to switch to aluminum "because forever more brass and copper were always going to be in short supply."

★ ★ ★

The members of the organization were warned not to believe this Government statement because "the cycle is about to change. The time is coming when we're going to have to work hard to dispose of our product."

★ ★ ★

He asserted that because of Government regulations the copper situation is "terribly confusing."

★ ★ ★

There are three Government-regulated prices on copper now, he said. The OPS ceiling is 24½ cents for domestic; 36½ cents for foreign copper and a price of 27½ cents for two firms that proved that the domestic price was not high enough for them.

★ ★ ★

Because of the shortage of domestic copper the demand is high as it is now the importation of copper from South America for July was 126,941 tons, the highest since January, 1947, he said.

★ ★ ★

The demand for copper, he said, "is still good but the pipelines are being filled up and inventories replaced." He pointed out that the amount of brass and copper wire for industrial purposes has decreased. In the first six months of 1947, 70 million pounds of wire were shipped, in the first part of 1951 tonnage was 58 million and in the first six months of this year 55 million pounds were shipped.

★ ★ ★

He made the following suggestions which he thought would keep production up when Government demands went down: The plant must be able to produce quality goods in quantity at competitive costs, the customer must be made to want the product, the sales people should be trained to know what the customers need. The industry should constantly seek new uses for brass and copper products and the selling costs, such as unnecessary

(*Please turn to page* 1236)

Fig. 2—10-Stand Mill reducing brass rod from 0.75" to 0.34" to be drawn into wire * * *

BUNCHED COPPER WIRE for ELECTRICAL CONDUCTORS

by Howard H. Allen, President
Nonotuck Manufacturing Company
Holyoke, Massachusetts

In this paper Mr. Allen discusses some of the problems attendant upon the bunching of copper conductor wire and makes a plea for the unification of government and commercial standards, which vary considerably. The paper was delivered at the first Regional Meeting of the Non-Ferrous Division of The Wire Association in Waterbury, Conn., on September 19, 1952.

The author graduated from Phillips Andover Academy in 1928 and from Harvard College in 1932. He worked for the General Cable Corporation from 1934 to 1937, in which last year he and his associates founded his present company.

It seems to me that bunched copper wire falls into two rather distinctly different categories. The first one would include standard constructions such as are ultimately incorporated into regular commercial products. These are the items that would normally be sold over the counter and be thought of as Underwriters types, either approved or non-approved. Their construction details and end uses are well described in ASTM Specification B 174-51T.

★ ★ ★

There is no need to dwell on these because, in general, they present little or nothing in the way of interesting problems. But there are other constructions that present very great problems, and these are the types that I propose briefly to discuss in this paper. I have reference, of course, to the strandings incorporated into finished electronic hook-up wire with special reference to sizes 22, 20, and 18.

★ ★ ★

If it were possible to key-note this subject in a few words I would have to emphasize that the situation is full of conflict and confusion. Basically the conflict is between what the electronic manufacturers really appear to want as exemplified by current commercial practice and what is desirable under the rather rigid specifications to which this type of wire now must be made before it is considered acceptable for use in filling military requirements.

★ ★ ★

Since this conflict does, in my opinion, exist; it seems to me that wire mills and insulators alike are placed in the unenviable position of having to produce, and sometimes even stock, two distinctly different products. This anomalous situation undoubtedly contributes to the cost of doing business and results in unnecessary confusion. Therefore, this paper is a plea to reconcile the apparent conflict to the end that we may all carry on with the large production job that faces us.

★ ★ ★

This reconciliation is urgently needed because the rapid expansion of the electronic industry during and after the Second World War has encouraged the growth of a considerable number of small and medium sized wire insulators dedicated to the task of supplying this vast activity. These plants are needed, and their efficient operation is vital to the normal chain of supply within the total American manufacturing effort. Any confusion that existed has now been compounded by this amazing growth, both in volume of output and number of plants involved.

★ ★ ★

For 15 years the chief requirement of a radio hook-up wire conductor was it be well tinned and tightly twisted for ease of soldering and so that the individual wires would not fan out when the strand was cut on assembly lines. Gradually 36 turns per foot (or .33″ lay) became the preferred degree of tightness of twist for sizes 22, 20, and 18. These conductors should also be as nearly round as possible for ease of insulating and for easier fitting into terminals and lugs.

★ ★ ★

Granting that the tinning job was without lumps and that the degree of twist was purely a matter of gear changing, the difficult operation was to take an odd number of wires and force them into a circular finished wire. Through the years we learned to do this by carefully arranging the wires as they were fed into the buncher, and by running this predetermined pattern through a closing die of such a size that the end result was a round conductor.

★ ★ ★

Thus we arrived at a wire that had every appearance of being a true concentric construction even though at some admitted sacrifice of physical characteristics. But there was no emphasis on these requirements or on compliance with particular specifications. The test purely and simply was based on performance; and this product as manufactured by our company and others received wide spread commercial acceptance; in fact, it became through usage almost an industry standard. All through World War II, I believe, this product was fully accepted in its field. The industry's chief problem then was to make enough of it.

★ ★ ★

No military specification that I know of was ever written around this exact type of wire, and the standards by which it is now being judged must have been based on physical data derived from a study of bunched conductors having a looser lay. During this latest Defense Effort our tightly twisted wire came under the scrutiny of Inspecting Departments who were given only JAN-C-76 as their authority. This latter specification is not severe by intent, but it seems to me that its conductors are primarily intended for cords rather than for electronic hook-up wire of the type we have been supplying to private industry for years. Nothing in it prohibits the manufacture of close lay material, but the physical requirements are somewhat severe when applied to tightly twisted conductors. They can be met best by means of constructions that are not now standard commercial practice.

★ ★ ★

It is not possible in this limited time to consider all the details of the problem posed by JAN-C-76. In fact, that would be beyond the scope of this paper. However, I am able to make some general observations based on my own personal experience. These will at least serve as a basis for the discussion which I hope will be inspired by these words at this meeting.

★ ★ ★

Let us consider, for example, the nominal areas in circular mils for stranded conductors as tabulated in this specification. These are apparently calculated areas based on squaring the diameter of the equivalent solid conductor. Commercial constructions in sizes #20 and #18 barely meet the minimum requirement of 98% of the areas stated. No allowance is made for compressing the individual strands in bunching, and certainly such allowance must be considered in writing a specification for hook-up wire because it is absolutely necessary to pull the wires through a tight closing die to make the finished conductor round.

★ ★ ★

The nominal strand diameters are all obviously based much more on cord bunching technique than on the method normally used in making hook-up wire. Here again no allowance is made for the tight die that must be used properly to finish the 10/30 and 16/30 constructions. This is hardly a critical dimension but it adds to the confusion because it is one more detail in which there is inconsistency.

★ ★ ★

With the single exception of #22 made with seven strands of #30 wire, the commercial constructions are also very close to the maximum limit on DCR. This, of course is the direct result of the working of the copper down into a compact and round cross section. While some allowance has obviously been made for bunched wire as opposed to solid in this instance, it is my feeling that there is not sufficient tolerance to make compliance sure without some substantial deviation from standard usage.

★ ★ ★

In our efforts to bring the commercial tight lay product within the severe physical requirements of JAN-C-76, we have found no difficulty with size #22. But with sizes #20 and #18, we have felt that industry practice should be changed by the addition of one wire to increase #20 from 10/30 to 11/30 and by the addition of three wires to increase #18 from 16/30 to 19/30. While this results in much better adherence to the specificat ion requirements, nevertheless it also adds to the confusion in a producing mill which must then maintain two stocks or furnish a more expensive conductor to its commercial hook-up wire customers.

★ ★ ★

As I interpret JAN-C-76 at the present time, it prohibits splices in the strand as a whole. Since most of the bunching equipment installed and available for current use cannot produce really long continuous lengths, it has been and still is normal wire mill procedure to braze short pieces into long lengths on large reels. This is necessary to the insulators who obviously need to be able to cover the greatest possible footage per string-up. It is now our custom to tag each braze on every reel shipped so that the insulator may cut them out of the finished product when it is destined for the military. These brazes presumably are not cut out of commercial wire.

★ ★ ★

Our industry sorely needs a standard construction for each size of bunched or stranded wire. It must be one that will be accepted by the wire mills and the electronic manufacturers as well as by the Military Procurement Agencies. With the single exception of seven strands of #30 for #22 gage, there is little but confusion in this picture. For example, we are currently making #20 stranded wire in the following ways:

10/30 Tinned, .33″ Lay
10/30 Tinned, .50″ Lay
11/30 Tinned, .33″ Lay
7/28 Tinned, .50″ Lay
19/32 Tinned, .50″ Lay
26/34 Tinned, .50″ Lay

★ ★ ★

Here we have four different base sizes and two different degrees of twist employed to make six variations of #20 wire. In theory, it would seem that 7/28 is nearly ideal for the military, but it has always been my understanding that it is not readily accepted or used widely by the electronic manufacturers who have always been accustomed to the minimum 10/30 construction.

★ ★ ★

There is much the same situation insofar as #18 wire is concerned. Currently our list of unfilled orders shows the following types in production:

16/30 Tinned, .33″ Lay
19/30 Tinned, .33″ Lay
16/30 Tinned, .75″ Lay
19/30 Tinned, .75″ Lay

★ ★ ★

It is true that this shows only one base size, but there are still four separate conductors with two different degrees of twist. Thus confusion within the producing mill is compounded by the vital necessity of keeping these various constructions separate and going to the right customer.

★ ★ ★

The latest attempt to write a general conductor specification is ASESA Project 172, with which many of you are probably familiar. It represents a complete listing and detailed make-up of every possible variation of every size of conductor. This is quite proper because the bidding will not be limited to a

few manufacturers. In the back of the Standard itself, however, there is a section under "Notes" which is entitled "Intended Use". Although this is not a definite recommendation, I am very much afraid that it may appear as such to newcomers in the field.

★ ★ ★

This section shows that hook-up wire is the intended use of #22 made with seven strands of #30. This is the only place where the intended use of this new Standard is in accord with commercial practice. Hook-up wire is also shown as the intended use of #20 composed of seven strands of #28 and of #18 made with nineteen strands of .0092", which is not even a B&S gage size. Neither of these are readily accepted by the commercial users, at least, I have been led to believe they would not be.

★ ★ ★

It seems that there has been a constant development in the efficiency of insulating machinery and in the value of insulating materials. This has resulted in a definite trend to higher running speeds and thinner walls. Both of these facts put a premium on round tight bunched wire conductors. Loosely twisted wire will birdcage in the tuber, and a conductor that is not perfectly round will make it hard to pass the concentricity provisions.

★ ★ ★

As the insulators put the squeeze on us, we in turn put the squeeze on the copper itself which makes it even harder to pass the physical requirements of JAN-C-76. This is known as a vicious circle, and wire mills are in the middle of it now.

★ ★ ★

It is going to take a good deal of understanding and cooperation by many people and interests to resolve what seems to me a very confused situation. Maybe it is within the scope of The Wire Association or a group of its members to sponsor an attempt to reconcile the conflicts and bring order out of seeming chaos.

★ ★ ★

Any committee that might be formed for this purpose should first try to bring the military requirements and commercial requirements into agreement so that only one type of finished and approved hook-up wire need be manufactured in each size of conductor. After determining what amount of safety and quality are needed in the wire, it would seem to me that the emphasis should be on practicality and economy. There would be little sense in standardizing a construction that our industry cannot produce in volume, nor would there be any need to specify more copper in the conductor than is required to carry the current.

★ ★ ★

We would like to have you

BECOME A MEMBER OF

THE WIRE ASSOCIATION

If you are engaged in the manufacture of rods, wire, wire products or electric wire and cable, or if you are supplying such concerns with equipment supplies or services, we extend a cordial invitation to you to become affiliated with the Association and to participate in its meetings and activities.

Please write us for a membership application card and the booklet: "The Wire Association—what it is and How it Functions".

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

453 MAIN STREET STAMFORD, CONN.

PRODUCTION OF BRASS AND COPPER WIRE

by Benjamin H. McGar,
Director, Metallurgical Department
Chase Brass and Copper Company
Waterbury, Connecticut

Mr. McGar discusses in particular the properties and processing of two brasses: yellow and cartridge, in this paper that he delivered before the first regional meeting of the Non-Ferrous Division of The Wire Association in Waterbury on September 18, 1952. Attention is called to improvements in processing and anticipated improvements that may eliminate some intermediate steps.

It is gratifying and encouraging to have such a large attendance here today at the first meeting of the Non-Ferrous section of the Wire Association in this vicinity, especially as we celebrate the 150th Anniversary of the founding of the brass industry in Waterbury. A large volume of water has gone over the dam of Mad River, where first brass mill was built, and since its modest beginning a great amount of capital has been invested to build and equip modern mills for the production of all forms of brass and copper products. However, after a century and half with all our accumulated know-how and technical skills we are still seeking methods to improve quality and increase production. The fascinating and interesting part of the metal industry is the fact that it constantly presents a challenge to all those associated with it, irrespective of their position.

★ ★ ★

We often speak of "old" methods and "new" methods, but there is no way of telling how soon a so-called modern method will become obsolete and the methods we are using today will probably become history tomorrow. It is within the realm of possibility that in the not too distant future wire will be made by some continuous method from the Casting Shop down to the finished product, thereby eliminating several intermediate operations. No claim is being made here that the methods described are by any means the best ones, and during the discussion it is possible that someone can present to us ways and means that are even better. No attempt will be made to describe the production of any of the numerous bronze alloys, and the discussion will be confined to the production of the various brass alloys and copper only.

★ ★ ★

Referring to the common brasses, there has been considerable difference of opinion during the past few years on the relative advantages and disadvantages of Yellow Brass (65% copper, 35% zinc) and Cartridge Brass (70% copper, 30% zinc) used for making rivets and screws. Needless to say there is no intention of going into the controversy at this time. However, it should be an interesting subject for some future symposium where the opinions of both the producer and the consumer could be freely expressed.

★ ★ ★

In the production of these two alloys the metal is treated very similarly—both are cast in 8″ diameter billets, 100″ long, in water cooled moulds that are fitted with copper liners, and the temperature of the circulating water is 130°F. The resulting castings weigh 1500 pounds, are sound, and have a smooth surface and good appearance. The Yellow Brass billets are cut 32″ long, and the Cartridge Brass billets 24″ long. These are heated to approximately 1450°F. previous to extrusion.

★ ★ ★

The Yellow Brass is extruded on two different sizes:

1) 0.625″, through a 4-hole die, and cold coiled.

2) 0.750″, through a 2-hole die, and hot coiled when long coils are desired.

★ ★ ★

The Cartridge Brass is extruded 0.687″ through a 5-hole die and cold coiled. After this operation the wire is inspected, the back ends cut to remove the pipe and also any skulls that might have formed during extrusion.

★ ★ ★

The Yellow Brass on 0.625″ and the Cartridge Brass on 0.687″ are then put on a Farrel 10-stand mill with grooved rolls, reduced to 0.250″ square, and coiled. The Yellow Brass on 0.750″ is put on a somewhat larger Farrel 10-stand mill, reduced to 0.340″ square and coiled; occasionally some Cartridge Brass is taken off at this size.

★ ★ ★

Both 10-stand mills are similar in construction, and the larger one is about 24 ft. long x 3 ft. wide x 4½ ft. high. It is operated by a 125 HP variable speed D.C. motor, and the finished rods come from the machine at the rate of 200 ft./min. The 7″ diameter case hardened alloy steel grooved rolls are geared independently of each other in order to prevent slippage during the rolling operation. There are some 12-stand mills in operation, and it is possible to increase the speed on this type mill if the petroleum base lubricant is continually cooled, thus making for greater production.

★ ★ ★

After the rolling operation the metal is annealed at 1250°F. for one hour, then pickled and washed. Following this the coils are butt welded together, and are ready for the first drawing operation on a large multiple die machine so as to produce both screw and rivet wire.

★ ★ ★

As an example, on producing 0.138″ Yellow Brass screw wire the operation consists of starting on 0.250″ square and drawing on the machine through four carbide dies to 0.151″, using a water emulsion of a fatty soap compound. The wire is then annealed at 1000°F. for one hour, with a resulting grain size of about 0.050 mm. It is then pickled and washed, and drawn from 0.151″ to 0.138″ with a reduction of 16% for the finished product.

★ ★ ★

The operations to produce Cartridge Brass 0.163″ rivet wire are to start drawing at 0.340″ square through six carbide dies to 0.169″. Then the material is annealed at 1000°F. for one hour to obtain a grain size of 0.050 mm., pickled and washed, and drawn from 0.169″ to 0.163″, approximately a 7% reduction.

★ ★ ★

The production of smaller diameter wire, sometimes designated as fine wire or pin wire, using the same two alloys is as follows: For example, the procedure for producing 0.011″ wire drawn 89% reduction consists of rolling on the 10-stand mill to 0.250″, annealing, pickling and washing, and then butt welding the coils. The wire is then drawn to 0.160″ with three carbide dies, followed by an anneal, pickled and washed, and butt welded. After this, it is drawn with seven carbide dies to 0.072″, again followed by annealing, pickling and washing, and butt welding. From there it is drawn to 0.032″ through seven carbide dies, followed by the same sequence of annealing, pickling and washing, and butt welding. The wire is finally drawn to 0.011″ through nine dies. All those above 0.020″ are carbide dies, and those below are diamond dies.

★ ★ ★

The production of wire from rich copper alloys, namely those from 83% copper, 17% zinc to 95% copper, 5% zinc differs somewhat from the operations used for producing Yellow and Cartridge Brasses. The rich copper alloys are cast in 8″ diameter billets, 100″ long, and are cut into 24″ lengths, heated to approximately 1600°F. and extruded to 1.687″ (1-11/16″). The rods are then rolled on a 3-high mill with grooved rolls with seven passes to 0.750″. Following this, without annealing they are placed on the Farrel 10-stand mill and rolled to 0.340″ and coiled. The metal is then annealed, pickled and washed, the ends butt welded, and drawn on the large multiple die machine to a minimum gauge of 0.128″. It is then transferred to an intermediate machine and, still without annealing, drawn to 0.050″. To produce smaller gauge wire the metal is then annealed, pickled and washed, and drawn to the desired gauge, similar to the operations for Yellow Brass wire.

★ ★ ★

The production of copper, and alloys of 95% copper, 5% zinc and 90% copper, 10% zinc, is often carried out by first hot rolling. The copper wire bars are purchased from the copper refineries, but the brass alloys are sometimes cast into 4″ square billets approximately 50″ long. Both the copper and the brasses are heated to about 1550°F. and hot rolled with several passes through grooved rolls to 5/16″. The metal is then pickled and washed, and drawn on the intermediate machine to 0.050″ and, without annealing, it is then transferred to another machine and drawn down to gauges in the proximity of 0.010″.

★ ★ ★

The recital of the tedious time-consuming operations now found necessary to produce the final product leads us to believe that there is a better way. The early brass producers, with few and inadequate tools and with little or no scientific knowledge to guide them, met the challenge with ingenuity, persistence, and vision to create a thriving industry. To every production manager, engineer, and metallurgist a similar challenge is presented for future progress. With additional mechanical developments and rapid phenomenal scientific knowledge, it is not an idle fantastic dream to visualize the reduction and elimination of several intermediate operations to bring us closer to our goal of shortening the distance between the castings and the finished product.

★ ★ ★

The 1953 Edition

of the Wire and Wire Products Buyer' Guide

should carry the advertising of every supplier to the wire industry. Now is the time to make your plans for representation in this useful directory—which is used throughout the industry as a buying reference. Write today for advertising rates and details.

WIRE AND WIRE PRODUCTS

53 MAIN ST. J. E. Donnellan, Vice Pres. STAMFORD, CONN.

What Are the Differences in Wire Drawing Lubricants?

by Leon Salz,
Manager, Lubricants Division,
Magnus Chemical Company, Inc.
Garwood, New Jersey

In this interesting analysis of wire drawing lubricants, there has been a worth-while contribution to the literature on the subject. Principles rather than products are disinterestedly discussed.

The author graduated in 1940 from New York University with a degree of B. S. in Chemistry and from the University of Michigan in 1941 with an M. S. in Chemistry, after which he took specialized training at the Polytechnic Institute of Brooklyn in lubricants. After two years with the Crane Packing Co., Chicago, he went with the Socony-Vacuum Laboratories in Brooklyn, becoming Senior Chemist. In 1949 he joined the Magnus Chemical Company and was shortly thereafter elevated to his present post. He holds a number of lubricant patents and has written several technical articles on the subject. Mr. Salz is a member of The Wire Association, The American Chemical Society and the American Society of Lubricating Engineers.

A primary objective in any wire mill is to draw the maximum tonnage of wire at lowest operating cost. The profits of the mill and in some cases, survival of the business, will depend upon the degree of efficiency with which the plant can operate. In this highly competitive period, good management, modern machines, intelligent manufacturing procedure and progressive thinking are needed as never before, to keep costs down.

★ ★ ★

While the selection of wire drawing lubricants may appear to be of minor consequence to personnel not technically familiar with the wire mill operations, these materials do represent a major factor in achieving maximum production. The use of the proper lubricant for a given set of operating conditions allows for faster drawing speeds, longer uninterrupted production, better looking wire and maximum life of expensive dies.

★ ★ ★

The purchase of the proper lubricant differs from the purchase of such materials as steel, machines, lime or acid, because lubricants are generally purchased neither against specification nor on the basis of laboratory inspection. Lubricants are usually selected only after service tests in the mill have shown that they are the best of the materials currently available. Visual examination of two competitive lubricants may indicate that they have identical color, consistency, odor and texture, while their performance characteristics may vary considerably. Similarly, these lubricants may meet a given set of specifications but show appreciable differences in die life and surface finish of the wire. Differences in the performance characteristics of wire drawing lubricants are attributable to modifications in basic formulations. For example, a dry drawing soap made from a high titre fat may give superior results in drawing stainless steel as compared with a similar competitive composition made with a somewhat lower titre fat, yet the differences by chemical analysis may be within the margin of experimental error. As another illustration, the addition of small amounts of certain defoamants to a wet drawing lubricant may have a marked effect on the product's performance but can pass undetected by routine chemical analysis. It is often these minor modifications in formulation that are the fruit of considerable expenditures in products development research.

Leon Salz * * * * * *

Wire Drawing Procedure

Wire drawing is performed by either a "dry" or "wet" process. In the former process, the rod or wire is generally pickled, washed and treated with an alkaline material such as lime, which after baking serves to neutralize residual acid and form a base for the lubricant. The use of proprietary alkaline type coatings is rapidly supplanting the procedure involving lime because they give cleaner operation, greater die life, superior rust protection, better finish on the wire and eliminate the time consuming baking period. Considerable attention is being given the use of mechanical descalers to supplant the removal of scale by acid pickling, but this very attractive alternative has not yet been developed to a point of general acceptance.

★ ★ ★

The dry drawing lubricant used may be a granulated soap or granulated soap plus pigment or a grease, the lubricant being placed in the box immediately ahead of the die. The alkaline coated wire passes through the box, picks up the lubricant, and then passes through the die.

★ ★ ★

Dry drawing may be used either in connection with single hole block

drawing machines or in multi-die continuous drawing machines, wherein the wire is given a number of successive reductions in the same frame. The use of dry process drawing is generally limited to ferrous wire larger than .035 inch diameter (20-gauge).

★ ★ ★

Wet drawing is employed for finer sizes in ferrous wire and for most non-ferrous wire. The process is conducted on continuous wire drawing machines wherein the lubricant is circulated over the dies, wire and blocks, to afford cooling as well as to reduce friction. Aqueous soap-fat solutions or emulsions are commonly used in steel, copper and brass wire drawing by the wet process. Compounded oils are used ordinarily in drawing aluminum wire.

How Difficult is Your Wire Drawing Operation?

In the selection of a suitable lubricant for a given set of service conditions, a number of factors must be considered.

1. Type of Metal

Wire of different metals vary considerably in their drawability. Metals with poor ductility and those which work-harden easily are most difficult. In general, among the more common metals, "stainless" gives the most trouble. followed in order of decreasing difficulty by high carbon steel, low carbon steel, brass, aluminum and copper.

2. Metallurgical Condition of Rod

The processing of rod in the course of manufacture has an important influence on its drawability. A highly ductile and tenacious material is most desirable. Ductility, which is the capacity of a metal to undergo plastic deformation under pressure, is related to the crystal (or grain) size of the metallic structure. For a given metal, greater ductility and correspondingly superior drawability are associated with a larger "average grain size". Metal is often annealed to order to increase the grain size and, thereby, enhance the drawability.

3. Physical Condition of Rod

It goes without saying that the surface of the rod should be physically clean and free of scale, rust and dirt for successful drawing. This is generally accomplished by acid pickling, followed by a water rinse, and the application of an alkaline rustproofing treatment in the case of steel.

4. Mechanics of the Operation

Under the term "mechanics" are included the speed of drawing, gauge of wire, percent reduction and efficiency of the die. More efficient lubricants are required for higher speeds, wider wire diameters and greater reductions because of the corresponding increase in heat from metallic deformation and friction.

★ ★ ★

The materials of constructions in manufacture of the die are of primary importance in determining the limitations in drawing speed and percent reduction. For example, carbide dies used in dry drawing will allow for more efficient conditions of operation than iron dies. The use of water cooled dies are helpful in that they assist in the dissipation of heat and allow a faster wire travel. For wet drawing of fine wire diamond dies are best.

How Do Wire Drawing Lubricants Function?

The purpose of a wire drawing lubricant is to provide an extensible film between the work and die capable of permitting rapid elongation of the wire under pressure with a minimum of friction and wear.

★ ★ ★

When work-die pressures are low, dilute soap solutions, general purpose soluble oil or straight mineral oil can give satisfactory service because the pressure is not great enough to rupture the lubricating film. As pressures become greater, compounds containing sufficient "oiliness" (polar) materials such as fats and dry soaps are required. These materials are adsorbed to metal surfaces, maintaining a persistent thin film where lubricants lacking sufficient oiliness would be squeezed out, resulting in welding and seizure. These latter conditions are evidenced by metallic "build up" on the die, the direct cause of scratch marks on the work.

★ ★ ★

In some cases "extreme pressure" materials are added to a wire drawing compound to minimize welding and seizure. The extreme pressure agents available function either by chemical or mechanical methods. Those materials that provide extreme pressure characteristics by a chemical method usually contain sulphur or chlorine which react with the work and die to form protective metallic surfaces highly resistant to welding and seizure. Compounds that function mechanically minimize friction by the incorporation of powdered spacing agents (pigments) such as lime, graphite, or mica in the drawing compound, these substances acting as separators between the work and die.

★ ★ ★

The ideal drawing lubricant for use under a given set of operating conditions is the one which permits the desired draw with a minimum of build-up on the die from the drawn metal, gives the greatest poundage of wire within the established gauge tolerance, and does the job in the most economical manner.

★ ★ ★

Classification of Wire Drawing Lubricants

The wire drawing lubricants commonly used may be divided into seven categories — dry granulated soaps, soap-fat paste compositions, compounded mineral oils, petroleum greases, soluble oils, graphite or molybdenum sulfide, and soft metals.

1. Dry Granulated Soaps

These soaps are used for "dry process' lubrication. They are employed almost to the exclusion of all other lubricants in the drawing of ferrous wire down to Number 20 gauge (.035 inches). Two types of dry soaps are commonly manufactured—sodium soaps and metallic soaps. When the coated wire passes through the granulated lubricant in the die box, a small amount of soap adheres to the coating surface and is carried into the die with the wire. The heat and pressure of the drawing operation transform the lubricant into a plastic film which serves

to reduce friction and minimize metal to metal contact (thereby preventing scratching and increasing die life).

★ ★ ★

The sodium soaps are prepared by reacting either caustic soda or soda ash with suitable fatty acid, such as the type obtained from tallow. The reaction product is dried, removing all water, then mechanically granulated to the desired particle size. The metallic soaps are prepared in a similar manner except that a calcium, aluminum or zinc type alkaline material is used instead of sodium. In those cases where a "leaner" or "less rich" soap is desired, pigments such as lime may be added either by the manufacturer or the user.

It is to be noted that the sodium soaps are water soluble but generally less efficient than their metallic (usually calcium) water insoluble counterparts. The latter have high melting points and consequently greater resistance to heat and carbonization. Sodium soaps are especially desirable for use where the lubricant must be removed from the wire in a subsequent operation.

2. Sodp-Fat Paste Compositions

These materials are generally used for all copper and brass wire and for ferrous wire above 20 gauge. Paste compositions are the conventional materials in use for "wet process" drawing.

★ ★ ★

While there are many modifications and variations of the paste type composition. all of them generally contain a water soluble soap, fatty material and water. For copper and brass wire drawing, high fat-low soap compositions are used for the coarser sizes whereas low fat-high soap compositions are formulated for fine wire drawing. The concentration of product to water ranges from approximately 1% for fine wire to 7% for initial reductions of rod. For fine ferrous wire drawing, a low soap-high fat composition is used, the concentration being kept within the limits of 0.5 to 3.0%.

The usual range in composition of a typical paste compound is given above:

Type of Material	Example of Component	Concentration range %
Soap	Potassium Stearate	10 - 65
Fats or fatty oils	Tallow	5 - 50
Unsaponifiable	Mineral Oil	0 - 15
Fatty Acid	Stearic Acid	0.5 - 3.0
Diluent	Water	25 - 40

3. Compounded Oils

A compounded oil is a mineral lubricating oil into which fatty material and possibly other additives have been incorporated. These products are widely used for drawing of aluminum wire of all sizes and are gaining popularity in drawing fine sizes of stainless steel in continuous wet drawing machines.

★ ★ ★

For aluminum drawing, soaps are out of the question because of corrosion or staining of this highly reactive metal, and high viscosity oils (3,000 Saybolt viscosity at 100°F.) are used on rod and heavy wire with progressively lower viscosities employed as the wire diameter is reduced. A compounded oil of approximately 200 Saybolt seconds viscosity (equivalent to SAE 10) is used for fine wire. The compounding consists of fatty material such as lard oil or tallow and may contain, in addition, emulsifiers for ease in aqueous cleaning. The percent compounding is in the range of 10 to 30%.

In the drawing of fine stainless steel wire, the compounded oil is prepared by blending fats and extreme pressure materials with a mineral lubricating oil having a viscosity of approximately 300 Saybolt seconds at 100°F. (equivalent to SAE 20). The extreme pressure materials are usually sulphurized and chlorinated compounds which react with the work to form a protective metallic surface highly resistant to welding and seizure.

★ ★ ★

It is to be noted that while the lubricity and wetting characteristics of compounded oils with respect to metals may be superior to soap-fat solutions, oils are less efficient coolants than water. As a consequence, care must be taken with the use of oils to avoid overheating the dies.

4. Petroleum greases

A petroleum grease is simply a mineral lubricating oil that has been gelled by the addition of soap at an elevated temperature. Greases are used where extra bright or clean finish on the wire is required, such as for coat hanger wire or welding rod. Grease drawing is accomplished in dry drawing machines.

★ ★ ★

The most common grease in service is "cup" grease which is made from a high titre calcium soap as the gelation agent. The addition of lime to the grease is sometimes practiced for improved results. It is important that the consistency of the grease be heavy enough so that it does not run out of the die box and yet sufficiently soft to prevent the wire from "channelling".

★ ★ ★

The use of soap-fat pastes (without water dilution) are sometimes used for grease drawing, although these materials are not technically greases. In recent years, special wire drawing greases have been prepared containing high concentrations of sulphurized and chlorinated extreme pressure materials. These more expensive products, are greatly superior to the calcium type "cup grease" in giving brighter wire and longer die life.

5. Soluble Oils

The conventional general purpose soluble oil, characterized by the formation of a milky, opaque emulsion when the oil is added to water, is prepared by adding emulsifiers (mineral oil sulfonates and potassium soaps) to a straight mineral lubricating oil. These soluble oils act as a rust inhibitor to the coolant water with which it is mixed, while providing some lubricating value. Emulsions of general purpose soluble oils do not have any more load carrying capacity than straight mineral oil, consequently are only

suited for very light drawing. Where a soluble oil is required for more difficult drawing, a heavy duty type may be used. Heavy duty soluble oils are prepared by adding a high concentration of extreme pressure compounds to the usual formulation of a general purpose soluble oil. The emulsions of heavy duty soluble oils are often characterized by a tan color (from the sulphurized material present) and have a load carrying capacity approaching that of compounded oils.

★ ★ ★

Soluble oils are used in concentrations ranging from 2 to 10%. A big advantage of soluble oils over soap-fat compositions for use in modern high speed continuous wet-drawing machines is the relative absence of foaming, especially when high concentrations are required.

6. Graphite

When hot drawing of wire is required, the use of graphite as a lubricant is most common. This material is used because of its greater resistance to decomposition by heat as compared with fats, soaps and mineral oil compositions. Graphite is regarded as the best of the "solid lubricants", (others being mica and talc).

★ ★ ★

A uniform coating of graphite on the hot wire is obtained by spraying a mixture of graphite and a voltaile liquid carrier such as water or kerosene. The liquid assists in spreading the graphite on the wire and is then lost through evaporation from the intense heat.

★ ★ ★

The type wires that are drawn hot include Tungsten, Rhodium and Iridium, all drawn at 1800°F, and some high speed steels and alloys.

7. Soft Metals

In the drawing of "tough" wire such as stainless, it is common practice to coat the wire with a softer metal such as lead, copper or tin. These metals have greater ductility than the base material and thereby facilitate the drawing operation.

Possible Effects of Minor Modifications in Formulation

As mentioned in the introductory remarks, the differences between lubricants for a given application can often be explained on the basis of minor modifications in formulation. Several examples will be given to bear out this point.

1. **The** conventional lubricant used in drawing heavy gauge copper wire is a water solution of a soap-fat paste. Two identical looking lubricants, Products A and B, were used for this application. After a week of service, Product A formed a green scum whereas Product B did not. More important, die life with Product A was considerably shorter than with Product B.

These differences are explained on the basis of the free fatty acid content of the products in question, being 4.1% and 0.6% for Products A and B respectively. What had happened chemically was that the free fatty acids reacted with copper in the system to form copper soaps (green scum). The products with the higher fatty acid content formed more of this abrasive material, causing premature die failure.

2. **Two** identical looking dry drawing soaps may differ with respect to their capacity to remain anhydrous. The greater tendency of one product to absorb moisture and "cake up" may be explained chemically by the presence of a small amount of glycerine in the soap. This chemical is deliquescent, absorbing moisture from the air. Glycerine is part of the fat molecule from which soap is made and can be present if appropriate steps are not taken for its removal.

3. **Two** identical looking wet drawing soaps for ferrous wire may differ in their resistance to acid contamination (on the wire). A water solution Product C was observed to decompose and separate into a fatty curd, whereas Product D remained a homogeneous dispersion. An inspection of the formulae showed that Product C was neutral in reaction, whereas Product D has excess free alkali. In the former case, the acid decomposed the soap but in the latter, the product was fortified with a neutralizing chemical.

Raw Materials for Wire Drawing Compounds

In order that the reader have a better understanding of wire drawing lubricants, it is believed that a brief discussion of the basic raw materials used in their manufacture would be helpful.

★ ★ ★

The use of fatty materials in wire drawing lubricants is basic and well known. This group may be divided into "fats" and "oils", the distinction being that the former are solid at 60°F, whereas the latter are liquid. Fatty materials are molecules consisting of chemically combined glycerine and fatty acids. The fats contain higher titre (melting point) fatty acids than the (fatty) oils. Examples of fatty materials are tallow, lard oil, castor oil, palm oil and neatsfoot oil. The chief purpose of fatty material in a wire drawing formulation is to give the product "oiliness". Such a product has a strong physical adherence to metal surfaces, minimizing metal to metal contact under extreme pressure. The reduction of friction in this manner is known as "boundary lubrication".

★ ★ ★

Free fatty acids are generally straight chain molecules having an acid or carboxyl group (—COOH) at one end. The more common ones are 18 carbon atoms in length. These acids are derived from fatty materials by the removal of the glycerine with which they have been combined in nature. Fatty acids are chiefly used as a component in the manufacture of soap. Small amounts may be present in wire drawing lubricant compositions to effect stability of the soap dispersion in water as well as a source of additional oiliness. Excessive amounts may cause metal corrosion, if in contact for a prolonged period, especially with copper. Examples of fatty acids are stearic, palmitic and oleic.

★ ★ ★

Soaps are prepared by chemical reaction between fatty materials of fatty acids and an alkali. In the former event, glycerine is produced as a by-product. Soaps may be water soluble or insoluble depending upon

the type of alkali which was used in its manufacture. Most soaps are excellent lubricants, either dry or in water solution. The water soluble types also serve as emulsifying agents for fatty material in paste compositions. In the manufacture of greases, soaps function as gelation agents. Examples of soaps are sodium stearate, calcium stearate, sodium oleate and calcium oleate. Care must be taken in the selection of soaps for aluminum or zinc wire drawing because excessive alkalinity will cause the development of a white stain on these chemically rather active metals.

★ ★ ★

Sulphur, chlorine or phosphorous compounds may be added to mineral lubricating oils, soluble oils, greases and sometimes to soap-fat compositions. They serve as extreme pressure agents minimizing welding and seizure between the die and the wire. Examples of these materials are sulphurized lard oil, chlorinated hydrocarbons and sulfochlorinated sperm oil. "Active" type extreme pressure compounds cause staining of copper and brass but generally will not affect ferrous metals or aluminum.

★ ★ ★

Pigments or spacing agents serve as extreme pressure materials by mechanically separating the die and wire. In this category we have lime and chalk and the "solid lubricants" —graphite, mica and talc. Pigments are avoided in wet drawing compositions because they tend to build up in the die. In addition, agitation is required to keep the pigment in suspension. Another problem that may be encountered is that the pigment may become entrapped in the metal surface, causing difficulty in cleaning.

★ ★ ★

Water is used in soap-fat compositions as a diluent essential to the compounding and so that the product may be dissolved more readily for use. Its primary value in wire drawing lubrication is as a coolant, being the most efficient readily available fluid for this purpose.

★ ★ ★

Mineral oil serves as a carrier for oiliness and extreme pressure materials in the manufacture of compounded oils, as well as a component of greases. The viscosity range used in wire drawing lubricants is from 100 to 3,000 Saybolt seconds at 100°F. Mineral oil is obtained by fractional distillation of crude petroleum.

Benefits of Superior Lubrication

In this post-war era, competition throughout the metal working industry is keen. Overall production costs are carefully figured. Contracts and sales may be obtained or lost on small differentials. Profits depend on the savings that can be made in (a) the cost of labor; (b) the cost of overhead; (c) the cost of raw materials and utilities; and, (d) the cost of drawing wire.

★ ★ ★

The wages of skilled operators are at an all time high. Whenever a machine is shut down, the operator attending that machine is usually idle. One of the chief causes of shut-down in a wire mill is die wear, necessitating the procurement and installation of a replacement die. This may require as little as 15 minutes, or as long as an hour. During this time the wages of the operator must be added to the cost of production, even though the machine is not drawing wire. This production cost is further increased by the cost of labor involved in reconditioning the die. The use of the most efficient wire drawing lubricant minimizes die wear, reduces shutdowns, lowers production costs and increases profits.

★ ★ ★

In addition to the cost of labor, the overhead expenses of a mill constitute a major item in the cost of production. Included in this category are property taxes, depreciation of the machines, the salaries of executives, clerical help and maintenance men, insurance, etc. These "fixed" expenses, representing a definite sum per year must be carried by the output from the machines. On this basis, each machine may be assigned a definite cost per eight hour day—say $50.00, or $6.25 per hour. Inasmuch as overhead costs continue regardless of whether the machine is in service or not, it is obvious that a shut-down is a costly affair. The use of a lubricant that assures longer die life and continuous production helps to increase plant profits.

★ ★ ★

The cost of dies is another factor to be considered with respect to the cost of a lubricant. The purchase price of dies may range from a few dollars to fifty dollars or more. The useful life of these dies depends on the number of times they have to be re-cut and the amount of material removed each time. This cost must be charged against the pounds of wire that can be drawn before the dies have to be scrapped, to say nothing of the down-time expense resulting from the more frequent changing of dies due to premature wearing or ringing. This charge is obviously increased when some of the wire must be rejected.

★ ★ ★

The cost of the wire drawing lubricant is by far one of the smallest of all production costs. Actually, it is merely the cost of the small amount of fluid or powder that is carried away by the wire, plus occasional new charges of the system (in wet drawing). The cost of a premium wire drawing lubricant can be more than justified by selecting one that materially reduces the overall plant production costs.

YOU ARE CORDIALLY INVITED TO JOIN THE WIRE ASSOCIATION and participate in its activities. In becoming a member, you help yourself and others to advance the interests of our great industry.

Send for application card

THE WIRE ASSOCIATION 453 Main St., Stamford, Conn.

IMPROVED LIME BATH PERFORMANCE BY RECIRCULATION

by Jere Y. Heisler,
Assistant General Foreman, Wire Drawing Dept.
Bethlehem Steel Company
Sparrows Point, Maryland

In this paper, presented at The Annual Convention of The Wire Association in Cleveland, Ohio, on November 10, 1952, Mr. Heisler describes a practice at Sparrows Point by which improved lime coatings have been secured.

Jere Y. Heisler was born in Easton, Pennsylvania, on February 18, 1923, graduating from Pennsylvania State College in 1944 with a B.S. degree in Metallurgy. After two years service in the United States Navy as an Electronic Technician, he returned to Penn State for graduate work in Metallurgy in 1946. He was employed by the Bethlehem Steel Company in 1947 and assigned to the Rod and Wire Mills at the Sparrows Point Plant. In August, 1949, he was made Production Engineer and in February, 1951, was promoted to his present position.

Introduction

The trend in recent years has been toward the elimination of lime as a pre-coating on rods in the cleaning house. Many substitutes have been developed which in most cases produce a uniformly coated coil with a pre-coating of comparable properties. The application of other products has been limited, however, and many wire mills must still depend upon lime coated rods for suitable wire finishes on extrusion, cold heading, and spring wire stock. The problems of lime tank operation and control should, therefore, be of continued interest to the men of the wire industry.

★ ★ ★

Considering the facts that lime has been used in the wire industry for more than two hundred years and that numerous articles have been published dealing with its application, it seems peculiar that lime problems should still exist. This fact, however, is quite true. The performance of a lime bath is still not always consistent or readily predictable. Often the adhesive characteristics of a lime bath will vary from day to day and week to week, and its usefulness as a pre-coating on rods prior to wire drawing is not always directly indicated by chemical analysis or by settling-rate tests on the bath. In addition, there are still differences of opinion regarding the best method of slaking lime for wire drawing.

★ ★ ★

With these facts in mind, this paper is presented not as an ultimate solution to the lime problems but rather as a discussion of some of the work done on lime coatings and particularly, the improvements which have been accomplished through the installation of recirculating lime tanks at the Rod and Wire Mills at the Sparrows Point Plant of the Bethlehem Steel Company.

★ ★ ★

Jere Y. Heisler

In 1950 a project was begun to improve the adhesion and uniformity of lime coatings, particularly on high-carbon rods for multiple-draft drawing jobs. Of the three in-line cleaning lines in the Wire Mill Cleaning House, the #1 line is primarily used for processing high-carbon rod and wire. Since the lime pre-coating operation is more critical on high-carbon stock the development work was restricted to this particular unit.

Cleaning and Coating Practice

Rod coils are moved through the #1 cleaning line by an overhead crane in hooks of four or seven 400-pound coils. Cleaning is done in either a cold 10% hydrochloric or in a hot 5% sulphuric acid bath. Next, the loads are water rinsed and then dipped in a pre-coating solution of sodium silicate. The silicate acts as a neutralizer for any residual acid and as a bonding agent between the lime and the steel which tends to promote heavier and more uniform lime coatings. In addition the silicate dip places a uniform film next to the steel surface which later acts as a continuous separation barrier between the steel surface and the wire drawing die, reducing friction in the drawing operation. The coils are then given two dips in a 6—8% lime bath, rolled between dips and baked for 5 minutes at 550° F. in a flash baker.

Selection of Quicklime

An investigation was first made to determine what properties are necessary in a commercial quicklime to

produce a hydrate with good adhesive properties. Briefly, the following chemical limitations appear to be of prime importance in selecting a suitable quicklime:

CaO	94.0% Min.
MgO	1.5% Max.
Total SiO_2, Fe_2O_3, Al_2O_3	1.5% Max.
CO_2	0.8% Max.
Combined H_2O	2.5% Max.

★ ★ ★

In addition to the above, and perhaps of greater importance, the quicklime should be extremely porous in nature in order to produce a hydrate of superior adhesive properties. The texture of the limestone from which the quicklime is manufactured, the type of kiln in which the lime is burned, the length of time and the temperature of burning have an important bearing on the ultimate porosity of the quicklime.

Hydrating Practice

Next, the hydrating practice was studied. Although there are many recommendations for pre-slaking and aging in a separate tank and bin, it was found that satisfactory results can be obtained by slaking rotary kiln pulverized quicklime directly in the operating tank with the following advantages:

1. **Materials handling savings**
2. **The elimination of a lime paste mixing and storage area**
3. **Closer control of lime-tub concentration by the addition of known weights of pulverized quicklime**

★ ★ ★

A series of laboratory beaker tests was then undertaken to evaluate the effects of the variables in hydrating quicklime against adhesion. In these tests lime adherence was measured using glass microscope slides, rather than steel rods, as the standard surface area. The slides were dipped in the various lime solutions, dried over a hot plate, and the lime evaluated for adherence according to an arbitrary 1, 2, 3, 4 rating when rubbed by hand. As a result of the above tests the following practice was set up for all of the lime tanks in the cleaning house, including the 6—8% lime tank in the high-carbon #1 cleaning line.

★ ★ ★

The lime tank is a 2000-gallon steel tank which is heated and agitated by an open steam coil laid out in a three-prong fork in the bottom of the tank. To make up a new lime bath, heat four parts of water at 180° F. and slowly add one part of quicklime by weight. Agitate the mixture until all violent slaking action is complete, add hot water and dilute the lime paste to operating strength. Maintain the lime bath at an operating temperature of 190-210° F. As the lime concentration decreases, subsequent quicklime additions can be made directly to the operating tank by slowly spreading the quicklime over the surface of the bath.

★ ★ ★

It was noted that the adhesive properties of the resultant hydrate are affected by the temperature and volume of the water used in hydrating and by the particle size of the quicklime. Best results were obtained when using water heated to at least 180° F. prior to the addition of the quicklime. Sufficient water should be available to both complete the chemical reaction and to distribute the excess heat generated during the exothermic reaction. Particle size must also be considered since it, too, affects the properties of the resultant hydrate. Pulverized quicklime, 98% of which will pass through a 300-mesh screen, was found to produce a hydrate of suitable adhesive properties.

Recirculator Unit

Although good adherent coatings were attainable after a new lime bath was made up using the above procedure, this condition fluctuated as the bath was used.

★ ★ ★

Samples of the lime solution were next analyzed daily for three weeks in an attempt to correlate fluctuations in impurities with the lime-bath concentration, settling rate, and adhesion factors. After plotting all of these factors there appeared to be no correlation between the fluctuation of SiO_2, Fe_2O_3, Al_2O_3, SO_3 and lime-bath concentration, settling rate, and adhesion.

★ ★ ★

Small additions of sodium hydroxide seemed to improve the adhesion and for some time it was suspected that there was a correlation between the alkalinity of the filtered solution and the adhesion of the lime particles to the rod surface. Consistent results, however, were not available to substantiate this theory.

★ ★ ★

In an attempt to improve the suspension of the lime particles and to provide a run-off for foam which periodically collected on the surface, the lime tank was then converted to a recirculating unit. The recirculator as shown in Fig. 1 consists of a main 2000-gallon tank with an overflow tray on the long side which leads to a 300-gallon collector tank. The lime solution is pumped by a slurry pump at the rate of 70 gallons per minute from the bottom of the collector tank through the pump and back into the bottom of the main tank. There are two discharge nozzles in the main tank which are arranged so that the solution rolls toward the overflow tray. The lime bath is heated by a closed steam coil in the collector tank and by an open steam coil laid out in a three-prong fork on the bottom of the main tank.

★ ★ ★

A new lime tank is made up, using the hydrating practice previously described, by mixing the paste in the small collector tank, diluting, and pumping it to the main tank where the water has already been added and heated to 180° F. All subsequent quicklime additions are made to the collector tank.

★ ★ ★

As the lime solution was recirculated a change was noted in its physical characteristics. The settling rate improved and the particles appeared to become smaller in size, creating a solution with practically no settling rate and with the characteristics of a colloidal suspension. After operation in this manner for about a week a point of equilibrium was reached which was accompanied by a marked improvement in the adherence of the lime to the cleaned rod coils to the extent that the lime had a "paint-like" adherence.

★ ★ ★

As the adherence factor increased the uniformity of coating also improved to such an extent that adequate coatings were obtained for any high-carbon multiple-draft drawing job with two dips in the lime solution and a roll between dips. It was found that the improved lime suspension in the recirculating unit can be operated at 4—5% concentration

and produce better adherent coatings than a 6—8% batch-type tank.

★ ★ ★

Continued operation of the recirculator showed that once the improved lime suspension was stabilized, subsequent additions of quicklime did not upset the equilibrium point and consistently good lime adherence results were attainable over a long period of time. Prior to the installation of the recirculator unit, the batch-type lime bath was dumped on an average of once every five weeks. With the installation of the recirculator unit the average lime bath life has been extended from 5 weeks to 16 weeks, during which time an average of 32,000 tons of rods are coated. In one period the lime bath was operated for 6 months prior to dumping. Usually dumping is only necessitated by pump failure or the build-up of scrap wire and lime impurities in the bottom of the tank.

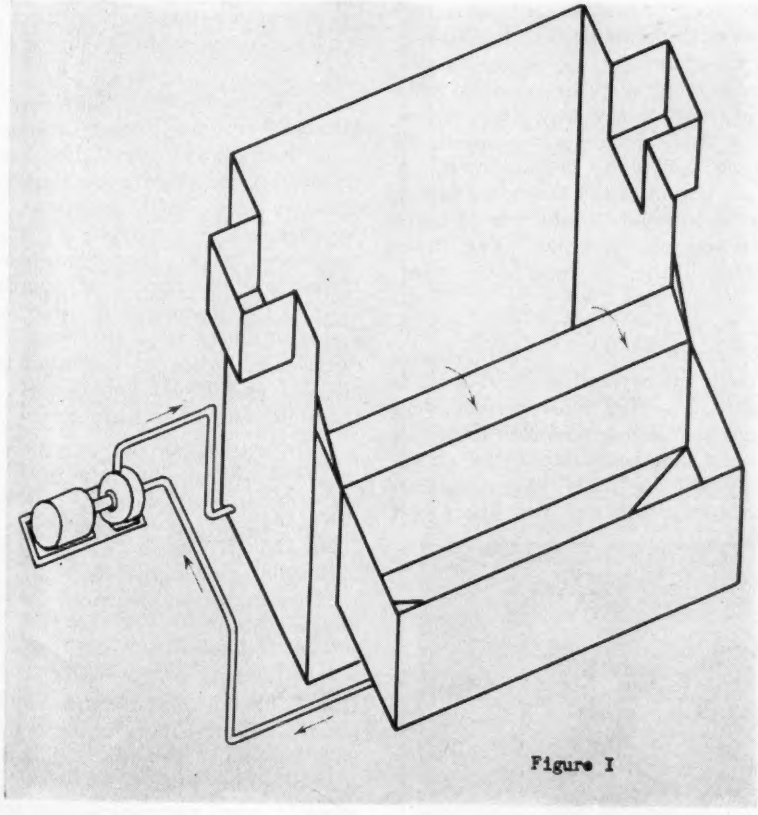


Figure 1

Discussion

As a result of these tests it seems apparent that good adhesive lime coatings can be obtained from a lime solution consisting of a suspension of extremely finely divided lime particles. These results substantiate the assumptions made by D. E. Washburn* who states "In common with all substances which are dispersed in water to colloidal size, slaked lime, on drying, has considerable binding action. It is, therefore, reasonable to assume that the adhesive value bears some direct relation to the colloidal size of the particles, and that the finer the particles, the more perfect the adhesion."

★ ★ ★

A lime solution consisting of a suspension of extremely finely divided lime particles can be obtained by the installation of a recirculating unit such as previously described.

★ ★ ★

There are two phenomena which can be advanced as a possible explanation for the conversion of the nature of the lime solution when a recirculator is installed. Since a colloidal suspension can be attained by decreasing the particle size of the suspended media, it seems logical to assume that the recirculator contributes toward the decrease in size of the lime particles. The lime particles undergo abrasive action while in constant motion throughout the system and while moving through the recirculating pump to the extent that particle sizes are decreased to a point where the lime solution assumes the characteristics of a colloidal suspension.

★ ★ ★

On the other hand, the recirculating system probably promotes and stimulates the hydration of the lime. The turbulent motion of the lime particles through the system gives them ideal hydrating conditions. Water can be absorbed steadily into the porous structure and hydration continues until each particle is completely saturated. Also, assuming that there exists after the burning of the limestone a cellular porous quicklime structure, this structure can be retained during hydration since there is always sufficient water available to carry off the excessive heats generated during slaking.

Conclusions

1. Satisfactory hydrating results can be attained by the careful selection of a quicklime according to chemical analysis and porosity. Although porosity is not readily measurable, due consideration must be given to the prior history of the quicklime, particularly the factors which contribute toward a porous quicklime.

2. The properties of the resultant hydrate are affected by particle size, temperature, and the volume of water used in hydration.

3. Increased lime adherence can be attained by establishing a lime solution consisting of a suspension of lime particles which are extremely small in size. The use of a recirculating unit is conducive to the formation of a lime bath such as described above.

4. Lime bath life can be extended to an average of 16 weeks by the installation of a recirculator unit.

★ ★ ★

(*Please turn to page* 1235)

*"Lime in Wire Drawing," D. E. Washburn, Wire and Wire Products, November, 1932.

GLASS PAPER AS AN ELECTRICAL INSULATING MATERIAL

by Kenneth J. Busse
Sales Manager, Micro-Fiber Division
Glass Fibers, Inc.
Toledo, Ohio

This paper was delivered by the author at the Annual Convention of The Wire Association on November 11, 1952, at Cleveland, Ohio. In it he describes the properties and applications of a new type of fibrous glass yarn recently developed.

Mr. Busse is sales manager of the Micro-Fiber Division of Glass Fibers, Inc., Toledo, Ohio. Shortly after receiving his degree in Chemistry from the University of Wisconsin, he began his career with Rayonier Inc., Shelton, Washington, as a research chemist. He is a member of T.A.P.P.I. and the Electrochemical Society.

The story of glass paper actually began December 5, 1950. On that date, scientists of the Naval Research Laboratories and the National Bureau of Standards announced that they had been able to produce the first all-glass paper.

★ ★ ★

The glass paper produced was made up of fibers with diameters from .5 to 1.5 microns. Though extremely fine, these fibers were still too coarse to yield a finished all-glass paper with the mechanical strength desired. The tests indicated that considerably higher mechanical strengths would be obtained as the diameter of the fiber was decreased (as the surface area to weight ratio was increased).

★ ★ ★

The government scientists, wanting glass paper of higher mechanical strength, soon realized their research work was being delayed by a lack of the finer glass fibers from which to make this needed material.

★ ★ ★

So it was that Glass Fibers' technicians were called to the Naval Research Laboratory and were presented with the important problem of producing fibers down to 0.1 micron diameter. It was believed that the Electronic-Extrusion process devised by R. H. Barnard, president of Glass Fibers Inc., would make possible the forming of these sub-micron diameter sizes.

★ ★ ★

Success was achieved by technicians working under the direction of Dominick Labino, Vice-President in charge of glass manufacturing and development, and on July 23, 1951, the nation's press announced that Glass Fibers Inc. had produced "the finest glass fibers ever made by man."

★ ★ ★

The fibers had been commercially produced in less than sixty days and the finest fibers were not only less than a micron but were .05 micron in diameter. To the student of measurement, it was six-millionths of an inch; the scientist read "Diameter of the new fiber is less than the shortest wave length of visible light"; the layman read, "A single pound of the new glass fibers, laid end-to-end, would extend more than ten million miles!" Yes, these are fine in the full sense of the word.

★ ★ ★

On February 6, 1952, Glass Fibers Inc. made another announcement. Quartz, the crystalline form of silica regarded as the most perfect electrical insulating material found in nature, had been duplicated chemically in the form of sub-micron diameter fibers and the fibers had been made into quartz paper.

Kenneth J. Busse

★ ★ ★

Such fibers of both glass or quartz can be dispersed in water, much the same as organic fibers, collected on a screen and converted into a thin "paper" sheet—as thin as 1½ to three mils (.0015 to .003 inches). Thus for the first time, the advantages of glass durability, dimensional stability, resistance to high temperatures, non-hygroscopicity, and high dielectric strength—were made available in thin paper sheets by processing these fibers through standard paper-making equipment.

"E" Glass Micro-Fibers

Micro-Fiber glass pulp is available in a borosilicate type glass compounded to produce good electrical qualities and high resistance to weathering. For convenience it is designated as "E" type micro-fibers. It has a glass density of approximately 157 pounds per cubic foot and a softening point of about 1500 degrees F. It has an expansion coefficient of .0000032 and is made in the following fiber diameters:

Types	Diameters
No. 102	.05 to .199 microns
No. 104	.2 to .499 "
No. 106	.5 to .749 "
No. 108	.75 to 1.49 "

(fiber diameter measured by air-flow method)

Quartz Micro-Fibers

Quartz fiber as manufactured in the form of Micro-Fibers is more than 98% pure silica. An outstanding feature of quartz fiber is, of course, its stability when exposed to high temperatures. Whereas most glasses have a softening point between 1000 and 1500 degrees F., quartz fiber has a much higher temperature limit, approximately 3000 degrees F. Paper made from quartz Micro-

Fibers will find use in electrical applications where extremely high thermal resistance and low electrical losses at high frequencies are desired. Product designations are:

Types	Diameters
No. 106Q	.5 to .75 microns
No. 108Q	.76 to 1.6 "

(fiber diameter measured by air-flow method)

★ ★ ★

Either Fourdrinier or Cylinder equipment can be used in making "glass-paper" from "glass-pulp" as manufactured in either of the two type fibers. The manufacture of glass paper closely resembles conventional paper making. Glass fiber is added to water in a beater, the stock is circulated for a short time and then dumped into the chest from which it is pumped onto a conventional Fourdrinier or Cylinder type paper machine. Conceivably, any paper mill in the United States could make it with a minimum of instruction. At this writing, a number of large paper mills are making the glass paper on standard equipment at conventional speeds, producing rolls of paper in regulation commercial widths.

Data From Typical Paper Run

The following data covers the results of one of the numerous runs of "glass-paper" made from "E" type "glass-pulp" manufactured by Glass Fibers Inc., the fiber having an average diameter of .5 to .749 microns. The run was made on a small commercial-size Fourdrinier with a 70-mesh wire, 33 feet long. The results are shown in Table I. This chart and the others are available in pamphlet form for you here at this meeting or simply by writing to us.

★ ★ ★

The above results have been greatly surpassed by commercial runs. For instance, papers made by Hurlbut Paper Company have tensile strengths around 800 psi, higher tear strengths and lower air resistance than stated above.

Commercial Applications

The initial uses of glass paper in the commercial fields are as an air- or liquid-filter medium, electrical insulation material, and as reinforcement in the laminating field.

Micro-Fibers For Filtering

Filter papers for gas mask use must remove the dangerous matter suspended in the air without interfering too much with breathing. Conventional filter papers make use of foreign raw materials; from the logistic standpoint alone, glass filter paper is a highly desirable product, since it eliminates the military problem of foreign imports. In addition, the new product is actually superior to asbestos-type paper in its filter properties. In a test in smoke-filled air, only one particle of smoke in 100,000 passed through. A smoke particle averages .2 microns (eight-millionths of an inch in size). By comparison, many commonly known bacteria measure 50 microns. It can be realized then that the new glass paper has a very high filtering efficiency—and in extensive tests it has performed without increasing the normal breathing resistance of the gas mask.

TABLE I

PROPERTIES OF GLASS FIBER PAPER

Physical Properties

Thickness	.0.0075 in.
Tensile Strength	177 p.s.i.
Density	0.22 gm./cc.
Density	13.75 lb./cu.ft.
Elmendorf Tear	16 lb.
Uniformity	Excellent
Dirt Count	0
Wet Strength	235 p.s.i.
Absorptivity	High
Porosity (Gurley)	Sec. 3.1
Air Resistance, H_2O/mil @ 8.5 m/min	14.5 mm.
Basis wt. 25 x 40-in. 500s	29.8 lb.

Chemical Analysis

Glass Fibers	100 per cent
Binder Quantity	0
Moisture Absorbed	0.1 per cent
Moisture Integral in Fiber	0
Softening Point	1500°F.
Weight Reduced by Heat	0.1 per cent
Flamability	0

Electrical Properties at 120°C. or 248°F.

Dielectric Constant	
a -- 60 cycles	1.075
b -- 1 kc	1.074
c -- 10 kc	1.073
Power Factor, Per Cent	
a -- 60 cycles	0.045
b -- 1 kc	0.020
c -- 10 kc	0.020
Dielectric Loss Factor	
a -- 60 cycles	0.0005
b -- 1 kc	0.0002
c -- 10 kc	0.0002
Dielectric Strength	
a -- ac-volts/mil	90
b -- dc-volts/mil	90
Volume Resistivity	2×10^{11}

It is easily visualized that the use of all-glass paper will not be confined to gas mask filters alone. A wide usage is apparent in the medical, chemical, bacteriological, radiological and commercial-industrial fields as well.

Micro-Fibers As An Electrical Insulation

The electrical insulating materials are produced in a variety of ways:

1. **The bulk fibers are sprayed into a plastic or resin, drawn into a thin sheet, cured and calendered to a very thin sheet.**
2. **The glass or quartz papers are produced through conventional paper making equipment and procedures and then impregnated and cured.**
3. **Glass or quartz papers are produced directly with added binders.**
4. **A "laminate" paper is made of two layers of glass papers with parallel continuous glass filaments enclosed between them, giving great tensile strength.**
5. **The glass or quartz papers are dipped in an impregnant bath and cured. (The glass or quartz papers saturated with impregnate yield a final product which is approximately 8% glass and 92% impregnate, by volume. Consequently the electrical values of these products are determined by the impregnate used.)**

The glass present performs four important functions:

1. **Raises the thermal resistance of the impregnate used.**
2. **Increases considerably the mechanical strength of the impregnate.**
3. **Doesn't detract from the electrical properties of the impregnate.**
4. **When present as the reinforcement of the plastic or resin the glass makes the final product resistant to "Cold-Flow" in magnet wire wrap, etc.**

★ ★ ★

Table II shows the comparative properties.

★ ★ ★

Products similar to the Teflon product mentioned above have been glass paper treated with silicone, formvar, polyvinyl chloride, or phenolic.

★ ★ ★

Quartz paper has inherent electrical insulating properties which fit it for very specific electrical insulating uses. Quartz paper withstands temperatures of 3000 degrees F. (far surpassing asbestos working limits); has low losses at high frequencies; and shows practically no deterioration when exposed to radiation. Applications of great strategic value are seen in components for nuclear instrumentation, nuclear reactors, and highly classified atomic weapons and missiles. The fibers themselves exhibit the identical chemical structure and electrical insulating properties of natural quartz crystals. Quartz paper is boron free, a characteristic that suggests application as electrical insulation for cables and various components which might be subjected to atomic radiation. Synthetic materials now available contain boron or similar chemical elements which trap the atomic particles called neutrons and so would become radioactive if used to insulate cables or other equipment used in the neighborhood of nuclear reactors or "piles." Since the quartz paper is boron free, neutrons will pass through it, and Navy scientists see potential uses for it as insulation in nuclear energy power plants, including nuclear-powered naval vessels.

TABLE II

	Teflon (Tetrafluoroethylene)	Glass Paper (92% air)	8% Glass Paper 92% Teflon
PHYSICAL PROPERTIES			
Specific gravity gms/cc	2.1-2.3	---	---
Water Absorption Percent	0.00	0.01	0.00
Softening Point °F	750	1500	900
Tensile Strength psi	1500-2000	176	3500
ELECTRICAL PROPERTIES (10^6 cycles)			
Dielectric Constant	2.0	1.075*	1.9-2.0
Dielectric Strength volts/mil	480	90*	820(.0015") 1170(.003")
Power Factor Percent	.02	.02*	.04
Volume Resistivity ohms/cc	10^{16}	$2x10^{11}$*	10^{15}

*60 cycles 25°C

Micro-Fibers In Wire And Cable Insulation

Commercial products produced from glass papers and used as electrical insulation on wires and cables are as follows:

1. **The American Machine and Foundry Company, 170 53rd Street, Brooklyn, New York, produce the glass paper reinforced plastic films of Teflon, Formvar, Polyvinyl chloride, and Silicones. The electrical properties of their Teflon film are stated in Table II. These products are actually a glass reinforced plastic, having high mechanical strengths, resistance to cold flow, high thermal resistance and the electrical properties of the plastic used. A magnet wire or cable insulated with these films would have the advantages of lower build-up and higher thermal resistance than glass yarn or cloth products presently used.**
2. **The Minnesota Mining and Manufacturing Company, 900 Fauquier Avenue, St. Paul 6, Minnesota, produce high tensile strength all-glass electrical tapes by sandwiching continuous filaments of glass between two sheets of glass paper. The resulting product has high tensile strength and high absorptivity.**
   The high tensile strength enables the all-glass tape to be tightly wrapped on the wire, cable, or coil. After being wrapped the glass insulated product is treated with an impregnant and cured. The high porosity of the all-glass tape allows 100% saturation by the impregnant. The all-glass tape serves as a high absorptive inorganic medium.
3. **Hurlbut Paper Company, South Lee, Massachusetts, produce a variety of glass papers to meet the specific electrical end use. They bind their glass papers with the type binder necessary to meet the final specifications and**

produce papers without binders to meet other specifications.
The latest glass papers have increased density to give higher dielectric strengths than previously possible. These papers should compete with refined asbestos papers, both performance-wise and cost-wise.

4. Micro-Fibers of "E" glass were applied to copper wire at General Electric Company, York, Pennsylvania, using regular asbestos carding machinery. The run was quite successful even though the glass coverage contained missed-spots. For the first trial using machinery designed for asbestos, the results were very promising. Future work is planned on this type of application.

Micro-Fibers In The Lamination Industry

The type of laminated products and the processes used to produce them are quite varied, but the following are a few examples:

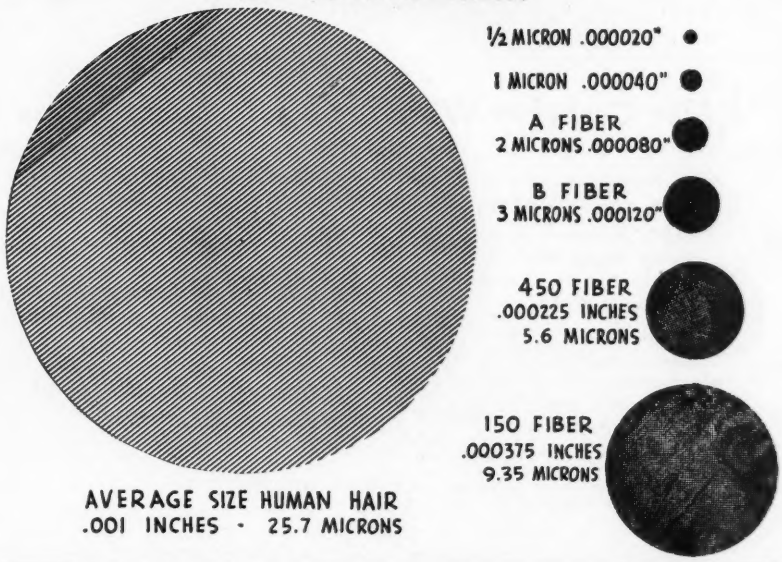
1. The glass or quartz paper is sprayed with resin and cured. The resulting products are thin sheets of glass-reinforced plastic. The sheets are as thin as .0009" and have high tensile strength; the electrical insulating properties of the resins are not impaired by the presence of the glass, while the mechanical strength is greatly increased. Several sheets of these materials are laminated together into a product of desired thickness and electrical insulating- or thermal resistant-properties.
2. Glass and quartz papers are dipped in a resin bath and cured. The resulting product is about 8% glass or quartz, 92% resin, by volume.
3. The bulk fibers of glass or quartz are sprayed into a mold similar to regular preform processes.
4. Glass or quartz fibers are laminated directly, while on the cylinder reel of a cylinder paper machine.

★ ★ ★

At present, the products made from glass and quartz papers are so varied that to completely cover all the general types is impossible. We believe that the known products represent only a fraction of the total eventual usage. We are depending on those industries desiring the unique qualities of glass and quartz papers to tell us of their specific needs so that through research, we can move ahead steadily, broaden the base of usage and progress in this startling new field.

Fine Wire

Microscopically fine wire made of pure nickel is used for the grids of sub-miniature vacuum tubes used in hearing aids. The wire, which is made of nickel because of this material's electrical characteristics, ductility and strength, is much finer than a human hair.


RELATIVE SIZES OF GLASS FIBERS VS. HUMAN HAIR
½ MICRON .000020"
1 MICRON .000040"
A FIBER 2 MICRONS .000080"
B FIBER 3 MICRONS .000120"
450 FIBER .000225 INCHES 5.6 MICRONS
150 FIBER .000375 INCHES 9.35 MICRONS
AVERAGE SIZE HUMAN HAIR .001 INCHES · 25.7 MICRONS

Your Advertising in JANUARY!

Cash in on the extra advertising value of this important special issue of

WIRE AND WIRE PRODUCTS

January is the Convention Proceedings and Annual Forecast Number of WIRE AND WIRE PRODUCTS. It is eagerly awaited by the hundreds who attended the Convention in November and by the thousands who could not be there. Reader interest runs high.

Therefore, you are invited to reserve advertising space in this important issue. Plan now for this advertising and write to us regarding the space you will need. Be sure your ad is in January.

If you do not have advertising rates or want other information, write to:

WIRE AND WIRE PRODUCTS
453 MAIN STREET **STAMFORD, CONN.**
J. Edward Donnellan, Vice Pres.

Two Tips to Top Tonnage

1 Use Carboloy Wire Dies

For maximum output in your wire-drawing operations, specify Carboloy Wire Dies.

They are made of Carboloy Cemented Carbide, the hardest metal made by man. They are designed and forged to give maximum strength, permit better lubrication, and stay on the job.

Continuous, precision production in *your* plant is assured by twenty-nine rigid quality-control tests in *our* plant, tests based on 24 years of experience as the world's largest maker of cemented tungsten carbides. That pays off for you in less downtime, more continuous production, *top tonnage!*

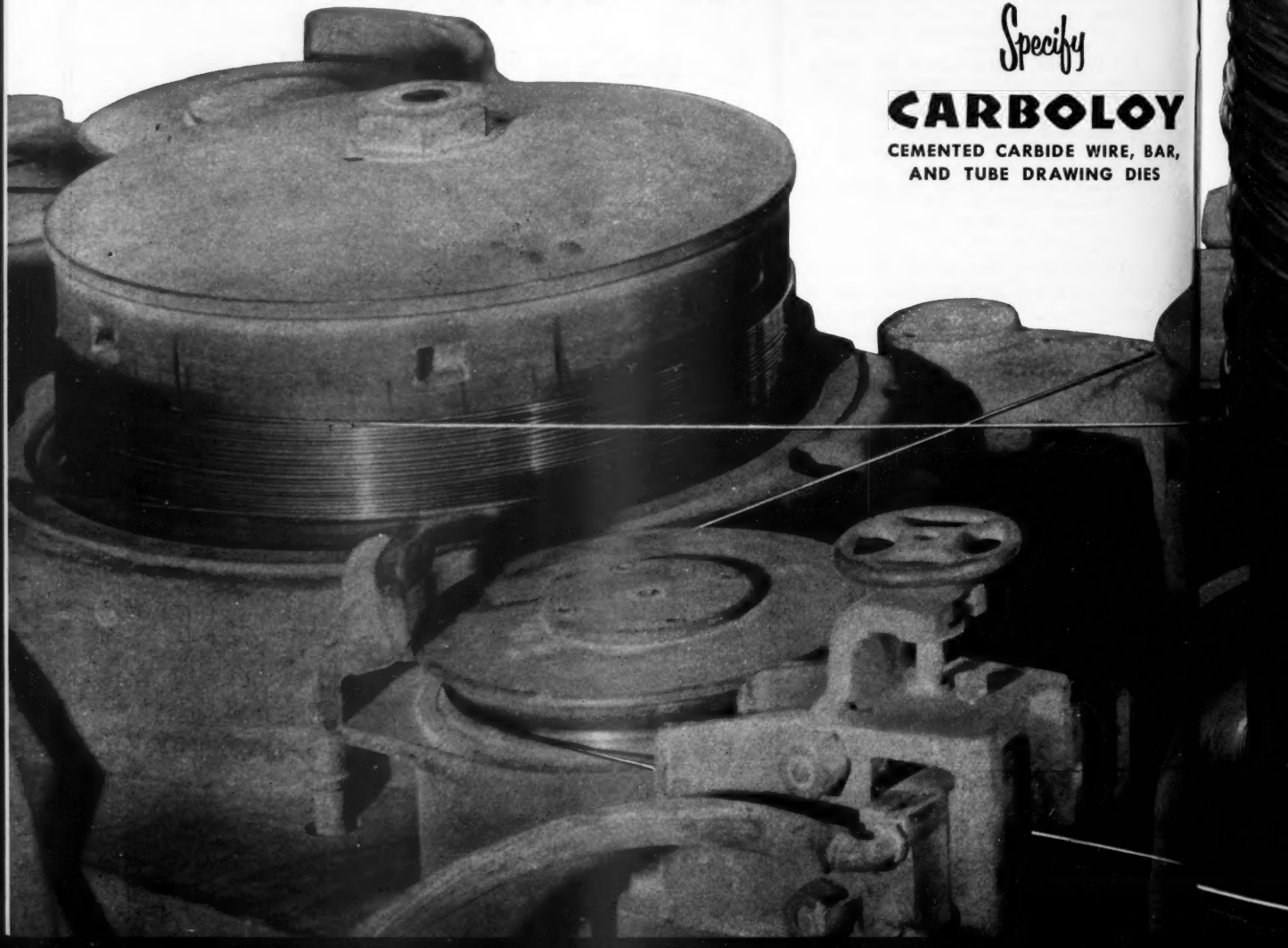
Note this, too: Complete stocks of standard dies, ready for immediate shipment to your plant, are maintained at Chicago, Detroit, Pittsburgh, and Los Angeles (see addresses in next column). This means you get die replacements as you need them, reducing the time your production equipment is out of action. It means lighter die inventories, too, and makes possible tighter production schedules.

2 Utilize Carboloy's Wire Die and Engineering Services

Have you a tricky die problem? Don't lose time – call in a Carboloy expert and let him trouble-shoot it for you. Carboloy engineers are always available to you through Carboloy Die Service Centers and District Offices.

Could your people know more about the application of carbides to wire drawing? Send them to school at the Carboloy Training School. The "profs" are tops and the rewards to you are ample in terms of greater efficiency and output in your plant.

Is die servicing and finishing costing you time . . . and money? Lost time means lost dollars. Get fast action by calling your nearest Carboloy Die Service Center: Chicago 7, Illinois (phone: Harrison 7-4828); Detroit 32, Michigan (phone: Jefferson 6-9100); Pittsburgh 19, Pennsylvania (phone: Court 1-4880); and Huntington Park, California (phone: Kimball 7276). Don't forget to write today for your copy of the big fully illustrated Carboloy Die Service Manual, packed with valuable tips.



Specify

CARBOLOY

CEMENTED CARBIDE WIRE, BAR, AND TUBE DRAWING DIES

Carboloy Round-Hole Dies: Exclusive hot-forge casing process gives greater over-all strength combined with compressive backing.

Carboloy Square-Shape Dies: Checked and double-checked by rigid quality-control tests to give extra stamina, longer life.

Carboloy Hex Dies feature larger bell openings. They permit better lubrication; give better-shaped rods of any material you use.

Carboloy Capstan Rings pull wire through die; resist wear of severe tension and abrasion. They help keep production rolling.

Header Die Nibs for heading bolts, screws, etc. Standard stock items in rough-cored form in 17 different sizes. Machineable. High shock resistance.

Carboloy Wire-Flattening Rolls provide accurate sizing and finishing as round wire is rolled into a specified flat strip.

"Carboloy" is the registered trademark for the products of Carboloy Department of General Electric Company

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11171 E. 8 Mile Road, Detroit 32, Michigan

Plants at Detroit, Michigan; Edmore, Michigan; and Schenectady, New York

Government Wire Production Information

Handbook of Emergency Defense Activities

The General Services Administration has announced the publication of the October 1952-March 1953 edition of the **Handbook of Emergency Defense Activities,** issued semi-annually.

* * *

The 120-page directory provides an invaluable aid for the businessman or anyone having official relations with the Government regarding defense activities. It contains names, addresses, and telephone numbers of principal officials and brief functional statements of Federal agencies whose functions are devoted primarily to the national defense program, such as the Office of Defense Mobilization, Defense Production Administration, Office of Price Stabilization, Mutual Security Agency, Small Defense Plants Administration, and Federal Civil Defense Administration.

* * *

Included for ready reference are a subject index, a name index, a list of commonly used abbreviations for Government agencies, and a separate list of officials from whom information may be obtained concerning additional Federal agencies.

* * *

Compiled by the Federal Register Division of the GSA's National Archives and Records Service, the Handbook may be purchased for 30 cents a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

* * *

Bolt, Nut, Rivet Producers Seek Higher Prices

The Bolt, Nut and Solid Rivet Industry Advisory Committee recently met with Office of Price Stabilization officials to discuss the possibility of ceiling price relief because of production cost increases—the committee's fourth meeting.

★ ★ ★

Industry prices are now governed by Ceiling Price Regulation 118, which became effective January 21, 1952. CPR 118 covers some 220 producers who manufacture 400,000 different kinds of bolts, nuts, screws

MICROMETER PRECISION

MICROMETER PRECISION — MICRO-WELD — TRADE MARK REGISTERED

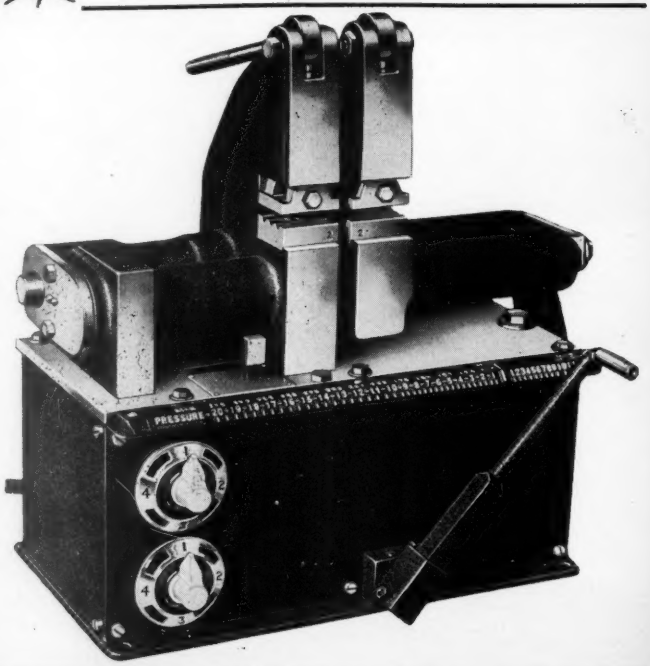
TRADE MARK REG. U. S. PAT OFF.

MODEL T-L MICRO-WELD BUTT WELDER

Welding capacity .080" to .375" diameter
STEEL wire

The Model T-L Welder which is a self-contained unit suitable for various types of Butt welding, is equipped with individual hand clamps, and a single control lever for the spacing operation, applying the upset spring tension, and contacting the welding switch.

This unit can be supplied for either bench mounting, overhead crane, or mounted on 4-wheel truck.



MICRO PRODUCTS COMPANY

20 NORTH WACKER DRIVE,

CHICAGO 6, ILL.

Telephone: STATE 7468

or rivets. Some producers make a wide range of these items, while the output of others is concentrated in relatively few lines.

★ ★ ★

The committee was informed that the only avenue for ceiling price adjustments, if such is considered necessary, will be under the OPS industry earnings standard. The standard provides that an industry which is not earning at least 85%, based on net worth before taxes, of the earnings for the best three out of four years from 1946 to 1949, is entitled to apply for higher ceilings.

★ ★ ★

OPS officials suggested using a flat over-all percentage to reflect the average cost increase on all products of the industry.

★ ★ ★

The discussion developed that, by reason of the bolt, nut and solid rivet industry's diversified production pattern and the difficulty of passing through increased steel costs, application of the earnings standard might be a complicated process.

★ ★ ★

Committee members were advised that, under GOR 35, Section 18, the director of OPS may issue supplementary regulations or otherwise take special action to adjust prices of particular commodities or industries to reflect the higher costs of pig iron, steel, copper or aluminum.

★ ★ ★

Committee members present represented companies whose production approximates 65% of the national total.

★ ★ ★

The committee agreed that application of the industry earnings standard to their problem is advisable and agreed to supply the statistical information required.

★ ★ ★

Brass Mill and Copper Wire Mill Products Recalculation of Ceiling Price Adjustments Covering Foreign Copper

The Office of Price Stabilization has announced that producers of brass mill and copper wire mill products will not be required to recalculate ceiling price adjustments covering cost of foreign copper before December 1, 1952.

★ ★ ★

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: SPECIFICATION RUST PROOFING AND PAINT BONDING CHEMICALS

SPECIFICATION NUMBER	ACP SPECIFICATION CHEMICAL	SPECIFICATION TITLE
QQ-P-416	"LITHOFORM" "ZINODINE"	PLATING, CADMIUM (ELECTRODEPOSITED)
RR-C-82	"LITHOFORM" NO. 32	CANS, CORRUGATED: ASH AND GARBAGE, TAPER-SIDE, ZINC-COATED, WITH COVERS
MIL-C-5541 (See also QPL-5541-1)	"ALODINE"	CHEMICAL FILMS FOR ALUMINUM AND ALUMINUM ALLOYS
MIL-C-16232 Type I Type II	"THERMOIL-GRANODINE" "PERMADINE"	COATINGS — PHOSPHATE; OILED, SLUSHED, OR WAXED (FOR FERROUS METAL SURFACES) AND PHOSPHATE TREATING COMPOUNDS
MIL-E-917A (Ships)	"GRANODINE" "LITHOFORM" "ZINODINE"	EQUIPMENT, ELECTRIC POWER, BASIC REQUIREMENTS FOR (NAVAL SHIPBOARD USE)
MIL-L-3077	"PERMADINE"	LINKS, METALLIC BELT, FOR SMALL ARMS AMMUNITION
MIL-S-5002	"ALODINE" "GRANODINE"	SURFACE TREATMENTS (EXCEPT PRIMING AND PAINTING) FOR METAL AND METAL PARTS IN AIRCRAFT
MIL-V-3329	"GRANODINE"	VEHICLES, COMBAT, SELF-PROPELLED AND TOWED; GENERAL REQUIREMENTS FOR
JAN-C-490, Grade I	"GRANODINE"	CLEANING AND PREPARATION OF FERROUS METAL SURFACES FOR ORGANIC PROTECTIVE COATINGS
JAN-F-495	"GRANODINE" "LITHOFORM"	FINISHES FOR EQUIPMENT HARDWARE
JAN-L-548A	"PERMADINE"	LINK, METALLIC BELT, 20 MM., MB
JAN-T-704	"GRANODINE"	TREATMENT AND PAINTING (FOR CONSTRUCTION AND ENGINEERING EQUIPMENT)
AN-E-19	"ZINODINE"	ELECTRONIC EQUIPMENT; GENERAL SPECIFICATION FOR
AN-F-20 (See also U.S.A. 3-213)	"ALODINE" "GRANODINE" "LITHOFORM" "PERMADINE" "THERMOIL-GRANODINE" "ZINODINE"	FINISHES, FOR ELECTRONIC EQUIPMENT
U.S.A. 57-0-2C Type II, Class A Type II, Class B Type II, Class C	"THERMOIL-GRANODINE" "PERMADINE" "GRANODINE"	FINISHES, PROTECTIVE, FOR IRON AND STEEL PARTS
U.S.A. 51-70-1 Finish 22.02, Class A Finish 22.02, Class B Finish 22.02, Class C	"THERMOIL-GRANODINE" "PERMADINE" "GRANODINE"	PAINTING AND FINISHING OF FIRE CONTROL INSTRUMENTS; GENERAL SPECIFICATION FOR
U.S.A. 50-60-1	"GRANODINE"	CONTAINERS, METAL, FOR ARTILLERY AND ROCKET AMMUNITION
U.S. Navord O. S. 675	"ALODINE"	SPECIFICATIONS FOR THE MANUFACTURE AND INSPECTION OF CARTRIDGE, POWDER, AND ROCKET TANKS (ALUMINUM)
U. S. N. Appendix 6	"LITHOFORM"	INSTRUCTIONS FOR PAINTING GENERAL SPECIFICATIONS FOR BUILDING VESSELS OF THE UNITED STATES NAVY
M-364	"PERMADINE" "THERMOIL-GRANODINE"	NAVY AERONAUTICAL PROCESS SPECIFICATION FOR COMPOUND PHOSPHATE RUST-PROOFING PROCESS
16E4 (Ships)	"ALODINE" "GRANODINE" "ZINODINE"	ELECTRONIC EQUIPMENT, NAVAL SHIP AND SHORE: GENERAL SPECIFICATION
AN-C-170	(See MIL-C-5541)	CHEMICAL FILMS FOR ALUMINUM AND ALUMINUM ALLOYS
U. S. A. 72-53	(See AN-F-20)	FINISHES (FOR GROUND SIGNAL EQUIPMENT)
AXS-1245	(See JAN-C-490)	CLEANING AND PREPARATION OF FERROUS METAL SURFACES FOR ORGANIC PROTECTIVE COATINGS (EXCEPT FIXED INSTALLATIONS)

CHEMICALS ACP PROCESSES

WRITE FOR DESCRIPTIVE FOLDERS ON THE ABOVE CHEMICALS AND FOR INFORMATION ON YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

Cover non-metallic sheathed cable, building wire and weatherproof wire

1800 feet an hour

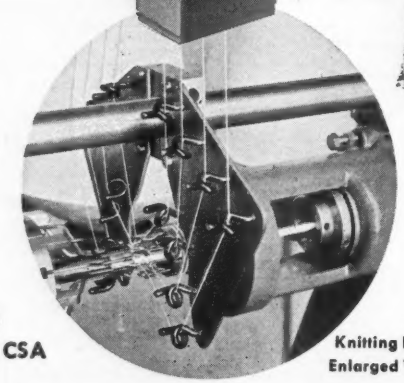
with

Fidelity **SINFRA**

KNITTERS

Model C-3H Knitter & Haul-Off Reel Stand

★ Increase speed 10-15 times
★ Save on cost of yarn
★ Boost labor output 600%
★ Eliminate yarn rewinding
★ Conserve floor space
★ Cut maintenance costs
★ Reduce power requirements
★ Minimize operating noise
★ Improve working conditions
★ Provides automatic control
★ Lower your capital investment
★ Approved by UL, ASA, AAR, CSA



Knitting Head Enlarged View

This *Fidelity Sinfra* Wire Covering Machine offers you high production speed and low operating cost. The output of *one* Knitter equals 15 conventional machines. Savings in yarn costs and direct labor alone pay for this new equipment in 12 to 24 months. Knit products are universally used and meet all standards.

The modern Fidelity Sinfra method uses fewer yarns and large 3 pound cones located on a stationary creel. High-speed, rotating Knitting Heads cover the wire at 30 or more feet per minute. Design permits horizontal operation at convenient working level with no crawling or stretching. Automatic electric stop motions and other advanced features cut maintenance and down time.

To see why top companies choose Fidelity, read our literature proving its advantages. Write today for Catalog W.

Manufacturers of intricate precision machinery since 1911

FIDELITY MACHINE COMPANY INC.

3908 FRANKFORD AVE. • PHILADELPHIA 24, PA.

On July 1, 1952, these producers were permitted to adjust their ceiling prices to reflect increased cost of foreign copper. This action was taken under Amendment 1 to Ceiling Price Regulation 68 covering brass mill products, and under Amendment 1 to Ceiling Price Regulation 110 covering copper wire mill products.

★ ★ ★

When these price adjustments were authorized, it was contemplated that the adjustments would be effective for a period of 90 days, and that a recalculation of the adjustments would be required as of September 15, 1952, to be effective on October 1, 1952.

★ ★ ★

However, it appears that producers are presently purchasing foreign copper for delivery in October and November at a prevailing price of 36½ cents a pound, which is the same price used in determining the current ceiling price adjustments. Therefore, it is not contemplated that any recalculation of the adjustments will be required before December 1, 1952.

New Nickel Sources to be Developed

The Defense Materials Procurement Agency has completed negotiations with two Canadian firms that will make it possible to start production immediately from another nickel deposit in the famous Sudbury Mining District of Ontario. Nickel is on the Defense Production Administration's "most critical" list.

★ ★ ★

One of the contracts announced provides that East Rim Nickel Mines Limited, of Toronto, will begin at once mining and crushing ore from its Sudbury property at a rate of not less than 3,500 short tons per month.

★ ★ ★

To assist in development of the Sudbury property, and at the same time augment U. S. supplies of nickel, DMPA has agreed to purchase up to 65,000 short tons of ore. The deposit is estimated to contain well over 2,000,000 tons of nickel sulphide ore.

★ ★ ★

Under a companion agreement, Falconbridge Nickel Mines Limited, also of Toronto, one of the world's largest producers of nickel, will process the ore for the Government's account in its plants at Falconbridge, Ontario, and Kristiansand, Norway. In addition to nickel, the ore is expected to yield significant amounts of copper.

★ ★ ★

East Rim has advised DMPA that it has spent approximately $1,000,000 in the partial development of its mine. However, the company has had no facilities for processing the ore.

★ ★ ★

It is expected that the company will use a high-pressure, high-temperature, ammonia leaching process which is just now coming into use on a commercial scale in the production of nickel.

★ ★ ★

There are other nickel deposits in the Sudbury area which are not being worked because of a lack of processing facilities.

Bureau of Standards Annual Report

Annual Report 1951, National Bureau of Standards Miscellaneous Publication 204, 105 pages, 28 halftone illustrations, 50 cents (order from Government Printing Office, Washington 25, D. C.).

★ ★ ★

Summarizing scientific and engineering investigations conducted by NBS during the fiscal year 1951, this booklet contains accounts of current activities as well as more detailed descriptions of especially important scientific developments. Its text provides a general description of work done in the 15 scientific and technical divisions and gives many specific examples of significant projects at NBS during the year.

★ ★ ★

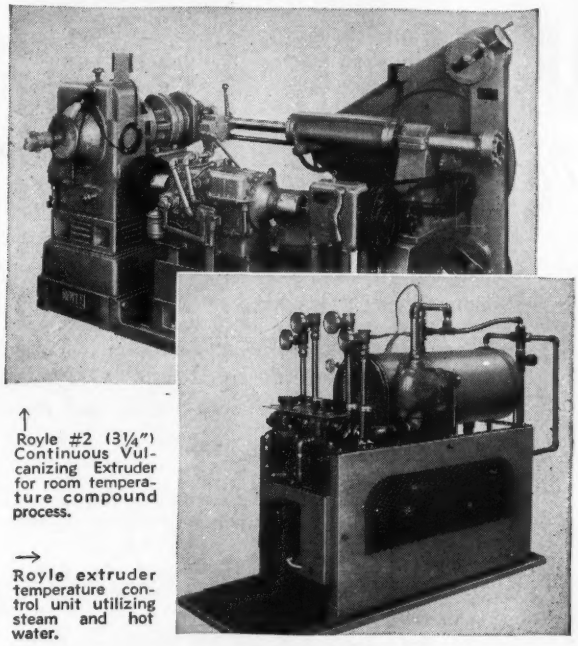
The scope of research and development at NBS is indicated by the names of these divisions: electricity, optics and metrology, heat and power, atomic and radiation physics, chemistry, mechanics, organic and fibrous materials, metallurgy, mineral products, building technology, applied mathematics, electronics, ordnance development (electromechanical fuzing, guided missile fuzing, projectile fuzing), radio

Of Particular Importance

To the Wire Insulating Industry

The room temperature compound process and associated equipment recently developed by the Western Electric Company, Incorporated, offer nine important advantages. These advantages begin with the storage of completely mixed, ready-to-extrude, rubber, GR-S, or Neoprene compounds and extend to a smoother and improved appearance for the finished product.

The complete extruder vulcanizing portion of the room temperature compound process is available to insulated wire producers* from John Royle and Sons who, for seventy-two years, have been building extruding machines to meet the most exacting process requirements.



↑ Royle #2 (3¼") Continuous Vulcanizing Extruder for room temperature compound process.

→ Royle extruder temperature control unit utilizing steam and hot water.

CHECK THESE ADVANTAGES:

- Improved diameter control
- Reduction in compound scrap
- Reduction in electrical faults
- Permits storage of completely mixed compounds
- Permits more economical scheduling of mixing equipment
- Eliminates "warm-up" operation
- Possible mill-room economies
- "Hot" machines may be converted
- Finished product has smoother finish—better appearance

**Licensees of Western Electric Company*

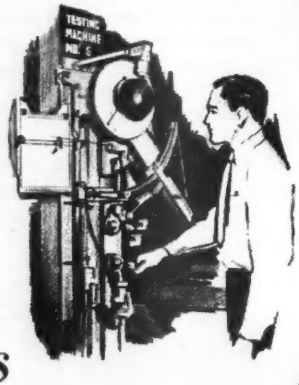
JOHN ROYLE & SONS
10 ESSEX STREET, PATERSON 3, NEW JERSEY

Quality . . .

the "Keynote" behind all

JOHNSON

Specialty Wires



Not only Music Wire, "the wire of a thousand uses," but a complete line of quality specialty wires is made by Johnson, including vacuum hose wire, aircraft cable wire, high carbon rope wire, hard drawn spring wire, oil tempered spring wire, high tensile galvanized steel wire, hose reinforcement wire (braided type), flat and half oval special spring wire, brush wire for hand and power brushes.

"Johnson Sets the Standard of the Industry"

JOHNSON

JOHNSON STEEL and WIRE CO., INC.

Worcester 1, Massachusetts

SUBSIDIARY OF PITTSBURGH STEEL COMPANY

propagation (ionospheric research, systems research, measurement standards), and missile development.

Prime Aluminum Producers IAC

Members of the Prime Aluminum Producers Industry Advisory Committee have asked the Office of Price Stabilization for an upward adjustment of the recent ceiling price increase granted to producers of primary aluminum mill products.

★ ★ ★

(On August 6, 1952, OPS issued Supplementary Regulation 113 to the General Ceiling Price Regulation, which authorized an increase of one cent a pound in ceiling prices for producers of prime aluminum pig and ingot, and an increase of five percent in ceilings for producers of primary aluminum mill products.)

★ ★ ★

Committeemen said the five percent increase in ceilings for aluminum mill products is insufficient in relation to the increase of one cent a pound in ceilings for aluminum pig and ingot. They stated that nonintegrated producers of mill products, who purchase their pig and ingot from integrated producers, have not been given a ceiling price increase sufficient to offset the additional cost of one cent a pound for pig and ingot and to ease the impact of increased cost of labor and materials in converting and fabricating prime aluminum into mill products. This "squeeze" also discourages expansion of mill product production, they said.

★ ★ ★

It was the consensus of the committee that ceilings for mill products should be increased about eight percent instead of five percent.

★ ★ ★

Members said that most mill product producers have cost data available to indicate the relationship of mill product production costs to the cost of pig and ingot, and that these figures could be used by OPS for a further consideration of an appropriate percentage increase to be applied to mill products.

★ ★ ★

OPS officials told the committee that the industry would be asked to furnish this data which would be used for further consideration of whether an upward revision of the percentage increase for mill products is necessary. They said that this

survey would be made as quickly as possible.

★ ★ ★

The committee mainly represents producers utilizing "prime" aluminum pig and ingot in the production of mill products, such as rolled, drawn or extruded aluminum, including sheets, bars, plate, rods, wire, foil, tubing and related products. Its membership includes representatives of the three large integrated producers—Alcoa, Kaiser and Reynolds—as well as nonintegrated converters and fabricators.

★ ★ ★

New Nickel Sources to be Opened

U. S. supplies of nickel will be boosted substantially during the next few years as result of contracts that have just been signed by two Canadian firms and the Defense Materials Procurement Agency.

★ ★ ★

The new agreements—with Milnet Mines Limited and Falconbridge Nickel Mines Limited, both of Toronto—would result in the production of 4,104,000 pounds of nickel, as well as considerable amounts of copper and some platinum and palladium.

★ ★ ★

The agreement with Milnet provides that the company will start mining ore from its properties in the famous Sudbury District of Ontario not later than March 1, 1953, and will produce ore at an average rate of 2100 short tons per week to the end of 1954.

★ ★ ★

The ore will be processed for the Government by Falconbridge in its facilities at Falconbridge, Ontario, and Kristiansand, S., Norway.

★ ★ ★

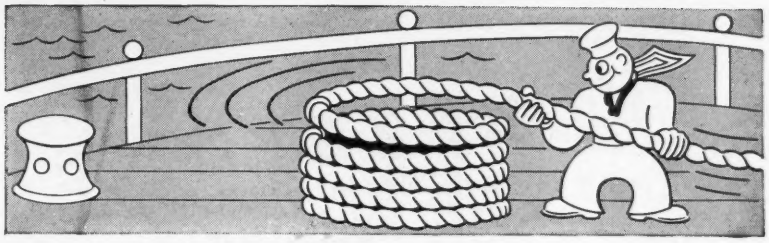
To assist Milnet in getting the mine into production, DMPA will advance the company $440,000, repayable with interest as ore is produced and sold to Falconbridge. Total cost of the project is estimated at $950,000.

★ ★ ★

The project will involve installation of machinery and the construction of a power line, access roads, a crushing plant, buildings and other facilities.

★ ★ ★

The Government has agreed to



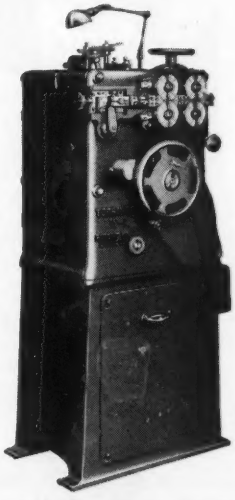
For a spring with accurate coiling

see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

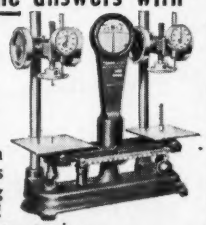
Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"



MODEL W-11 SPRING COILER

Wire diam. range: .015" to .072". Length per spring: 0" to 42". O. D. Coil Range: 3/32" to 1 9/16". Produces 23 to 190 springs per minute with variable speed drive. Extra wire feed gears, torsion, other attachments available.

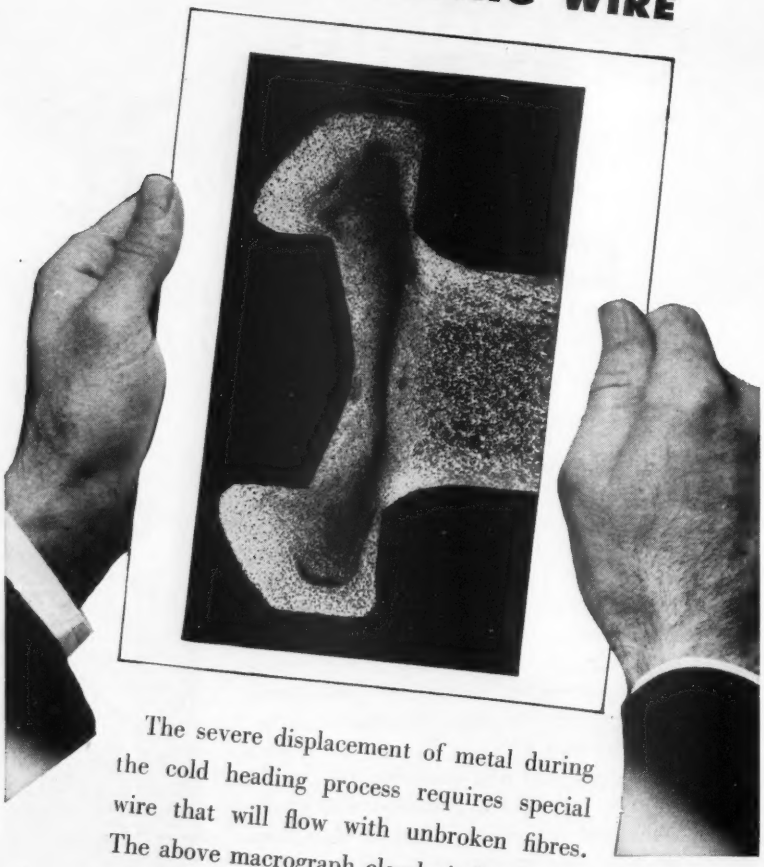
NOW... Spring Makers and Users can get the same answers with The TORRINGTON SPRING TESTER



An accurate, uniform and inexpensive means of measuring spring load and deflection! For inspection or in-use testing . . . to aid in designing and developing springs for specific uses or as a basis for statistical quality control. Write today for illustrated bulletin on the Torrington Spring Tester!

The TORRINGTON MANUFACTURING COMPANY TORRINGTON, CONNECTICUT

KEYSTONE
"SPECIAL PROCESSED"
COLD HEADING WIRE



The severe displacement of metal during the cold heading process requires special wire that will flow with unbroken fibres. The above macrograph clearly indicates the excellent grain flow in a recessed-head screw made from Keystone "Special Processed" C-1012 Cold Heading Wire.

Keystone's "Special Processed" Cold Heading Wire is available in C-1035 and C-1038 analysis for high strength, heat treated screws and bolts.

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

purchase 4,104,000 pounds of nickel, which the Milnet output is expected to yield, and such platinum and palladium as are found in the ore. The Government also agrees to purchase any copper recovered from the ore if offered by Falconbridge.

★ ★ ★

Base prices for nickel, platinum and palladium, with some leeway for adjustment to market quotations, will be: Nickel, 56.66 cents per pound; platinum $93.00 per troy ounce, and palladium, $21.50 per troy ounce, all f.o.b. Kristiansand. A floor-price of 27½ cents a pound for the copper, f.o.b. Kristiansand, is guaranteed by the contract.

★ ★ ★

DMPA's agreements with Milnet and Falconbridge are similar to agreements signed recently with Falconbridge and East Rim Nickel Mines Limited, of Toronto, but the latest agreements provide for much larger quantities of nickel.

Portable Hardness Tester Offered

Pacific Transducer Corp. of 11921 West Pico Boulevard, Los Angeles 64, California, offers a new low cost portable pocket hardness tester for determining the hardness of steel alloys and other metals in the range of from 25 to 65 Rockwell "C" scale.

★ ★ ★

The test set features portability. It can be carried in the pocket on the job. It may be used to test specimens of steel alloy in almost any place or position. It is a direct reading device. No further calculations are required. This makes the unit particularly fast in operation.

★ ★ ★

The test includes a microball indentor, a measuring microscope and a standard hardness test block. It operates by means of an impact indentor which drives a 1/16″ tungsten carbide ball a short distance into the sample to be tested. The diameter of the indentation is then measured by the reticulated microscope. As the diameter is a function of the hardness, the reticle indicates the hardness directly. It is accurate ±1½ points "C" scale.

★ ★ ★

It lends itself particularly to use by field engineers, maintenance engineers, sales engineers and plant engineers. It is particularly adapted for

testing all parts of large dies, punches and large welds as well as for structural steel, tanks and large pipes in position where only a portable hand tester of this type can be used. The net price of the unit is $69.00.

★ ★ ★

Anaconda To Produce Aluminum

Cornelius F. Kelley, chairman of of the board of Anaconda Copper Mining Company, has announced the completion of the organization of its subsidiary, Anaconda Aluminum Company (formerly Harvey Machine Co., Inc. of Montana). **Francis O. Case,** who is a vice president of **Anaconda Copper Mining Company,** has been elected president of **Anaconda Aluminum Company.**

★ ★ ★

The aluminum reduction plant will be built near Columbia Falls, at the base of Teakettle Mountain, in Flathead County, Montana. Two pot-lines together with accessory buildings and equipment, capable of producing 50,000 tons of aluminum annually, will be installed.

★ ★ ★

Construction preliminaries on the $45,000,000 project were begun soon after the announcement on September 3 that the Anaconda interests had completed arrangements to obtain alumina for the operation from Reynolds Metals Company. The project will be financed by the Anaconda Company.

★ ★ ★

New Capacitor Catalog For Military Micas

The Sprague Electric Company has just released a new comprehensive catalog on its transmitter type mica dielectric capacitors which conform with Joint Army-Navy Specification JAN-C-5.

★ ★ ★

Designated Catalog 31, this new reference for engineers and purchasing agents consists of thirty-two easy-to-follow pages of helpful illustrations, engineering drawings, and technical characteristics of each unit. Copies are available upon letterhead request to Sprague Electric Company, 207 Marshall Street, North Adams, Mass.

★ ★ ★

THESE 4 Solar COMPOUNDS ARE "Conditioned" for conditions!

BECAUSE both the angle of the glass braid, particularly on building wire and armored cable conductors, and the temperature conditions encountered during shipping, warehouse storage and installation have a direct bearing on the particular types of saturants and finishers used, it is important to your company that you are aware of the qualifications of various compounds.

Solarite KS-566 Saturating and KF-561 Finishing Compounds—used over all glass braided, rubber covered wire and non-metallic sheathed cable—are specifically designed to meet stringent conditions. They provide excellent moisture resistance, retain flexibility at low temperatures and prevent sticking in coils at extremely high temperatures.

For more normal conditions where extremities are not likely to be encountered, it is more practical and less expensive to apply Solarite KS-709 Saturating and KF-715 Finishing Compounds. These materials have excellent tank stability, operating characteristics and flame retardant qualities.

SPECIFICATIONS

Solarite KS-566 Saturating Compound		Solarite KS-709 Saturating Compound	
Softening Pt.—(B & R)	140°F. Min.	Softening Pt.—(B & R)	120°F. Min.
Penetration @ 77°F., 100 gr., 5 Sec.	60-75	Penetration @ 77°F., 100 gr., 5 Sec.	44-55
Stormer Viscosity @ 300°F. 100 Revolutions	85-110 Sec.	Viscosity, Stormer @ 300°F., 100 Revolutions	28-34 Sec.
Specific Gravity @ 25°C.	1.00-1.04	Specific Gravity @ 25°C.	1.02-1.06
Flash Pt.	500°F. Min.	Flash Pt.	530°F. Min.
Fire Pt.	600°F. Min.	Fire Pt.	600°F. Min.
Solarite KF-561 Finishing Compound		**Solarite KF-715 Finishing Compound**	
Softening Pt.—(B & R)	220°F. Min.	Softening Pt. (B & R)	200°F. Min.
Penetration @ 77°F., 100 gr., 5 Sec.	14-16	Penetration @ 77°F., 100 gr., 5 sec.	7-10
Viscosity, Stormer—360°F.	3-10 RPM	Viscosity, Stormer—36°F.	5-12 R.P.M.
Specific Gravity @ 77°/77°F.	1.02-1.06	Specific Gravity— 77°F/77°F.	1.02-1.06
Flash Pt.	Over 500°F.	Flash Pt.	500°F.

Note: Regardless of what combination is used, it is important that paint be used as an anti-stick.

The services of our technical staff are available to you without obligation.
For additional information, write Solar Compounds Corporation.

Solar Compounds Corporation
Solar Varnish Corporation
1213 WEST BLANCKE ST. · LINDEN N. J.

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: INDEX OF ACP CHEMICALS FOR METAL PRESERVATION AND PAINT PROTECTION

METAL	OPERATION	ACP CHEMICAL
ALUMINUM	*Cleaning*	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Preparation for Painting	"ALODINE" "DURIDINE" "DEOXIDINE"
	Protection from Corrosion	"ALODINE"
BRASS	*Brightening*	"ACP BRIGHT DIP"
	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "CUPROTEK
	Corrosion Prevention	"CUPROTEK"
	Soldering Flux	"FLOSOL"
COPPER, BERYLLIUM, AND COPPER ALLOYS	*Brightening*	"ACP BRIGHT DIP"
	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "CUPROTEK"
	Coating Steel with Copper	"CUPRODINE"
	Corrosion Prevention	"CUPROTEK"
	Scale Modification	"RIDOXINE"
	Soldering Flux	"FLOSOL"
	Stripping Copper Coatings	"ACP COPPER STRIPPING SOLUTION"
GALVANIZED IRON, ZINC, AND CADMIUM	*Cleaning*	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Corrosion Proofing	"ZINODINE"
	Paint Bonding	"ZINODINE"
	Phosphate Coating, in Preparation for Painting	"LITHOFORM"
	Soldering Flux	"FLOSOL"
IRON AND STEEL	*Chromate Coating, in Preparation for Painting*	"CROMODINE"
	Cleaning	"ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "DURIDINE"
	Coating with Copper	"CUPRODINE"
	Drawing and Extrusion	"GRANODRAW"
	Paint Bonding	"CROMODINE" "DURIDINE" "GRANODINE" "PERMADINE" "THERMOIL-GRANODINE"
	Paint Stripping	"CAUSTIC SODA AND SOLVENT NO. 3"
	Phosphate Coating, in Preparation for Painting	"DURIDINE" "GRANODINE" "PERMADINE" "THERMOIL-GRANODINE"
	Phosphate Coating, to Protect Friction Surfaces	"THERMOIL-GRANODINE"
	Pickling with Inhibited Acids	"RODINE"
	Rust Prevention for Unpainted Iron	"PEROLINE"
	Rust Proofing	"PERMADINE" "THERMOIL-GRANODINE"
	Rust Removal—Brush, Dip, or Spray	"DEOXIDINE"
	Soldering Flux	"FLOSOL"
MAGNESIUM	*Cleaning*	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Pickling	"RODINE (M-200)"
STAINLESS STEEL	*Cleaning*	"DEOXIDINE"
	Coating with Copper	"CUPRODINE"
	Pickle Polishing	"RODINE"
	Soldering Flux	"FLOSOL"

CHEMICALS ACP PROCESSES

WRITE FOR DESCRIPTIVE FOLDERS ON THE ABOVE CHEMICALS AND FOR INFORMATION ON YOUR OWN METAL PROTECTION PROBLEMS

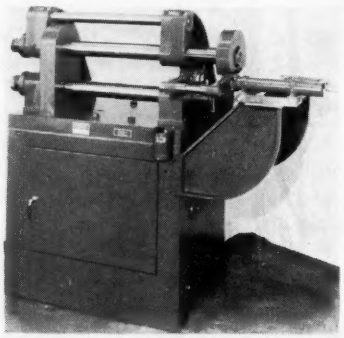
CHEMICALS ACP PROCESSES

New Carlson Wire Cutting Machine For High Speed Wire Cutting

A new heavy duty machine for cutting black tempered and other straight wires, is announced by the **Carlson Tool and Machine Company,** Geneva, Illinois. Features of the machine include high production capacity, long life tooth-type cutters, and easy set-up for adjustment of wire length to be cut.

★ ★ ★

This new Carlson Model 51 Wire Cutter is 62″ long, 30″ wide, 57″ high and weighs approximately 1700 lbs. Cutting capacity varies, depending upon the length of wire desired and operator, up to 150 lbs. per hour. Machine may be set to cut any length of wire required.



Two 8″ diameter rotary tooth-type cutters are made of ground high-speed steel. 3″ diameter shafting, turned and ground, runs in Oilite and ball thrust bearings. Machine is powered by a 3 HP, 3-phase, 60 cycle gear head electric motor . . . ample power for all cutting jobs.

★ ★ ★

Complete details on the Carlson Model 51 Wire Cutter may be obtained by writing the manufacturer . . . your inquiry is invited.

★ ★ ★

A Review of Magnetic Materials

A 12-page pamphlet covering a range of 20 high-permeability materials and 22 permanent magnet alloys. Typical properties are given in table form and comparative information is discussed in the text and illustrated by 15 charts. Applications are drawn primarily from the communications field and illustrate practical usage of the various alloys. Write to **International Nickel, Dept. EZ,** New York 5, N. Y., for a copy.

Outstanding Personalities of the Wire Industry

Howard T. Brinton Now Heads Phelps Dodge Copper Products

Robert G. Page, President of **Phelps Dodge Corporation** has announced that **Howard T. Brinton** has been elected President of the **Phelps Dodge Copper Products Corporation** fabricating subsidiary of the Phelps Dodge Corporation.

★ ★ ★

Vice President of the Corporation since 1937, Mr. Brinton was elected President at a special meeting of the Board of Directors on September 23rd. He fills the place recently made vacant by the death of Whipple Jacobs, President of Phelps Dodge Copper Products Corporation for the past three years.

★ ★ ★

Mr. Brinton entered the wire and cable business in 1912 when he became employed at the Yonkers, New York plant of the Habirshaw Wire and Cable Company, predecessor to the present Habirshaw Division of the Phelps Dodge Copper Products Corporation. In 1919 he moved from the Yonkers works to the New York office. In 1932 he was named Sales Manager of the Company and in 1937 was elected Vice President of the corporation. A member of the Board of Directors of the Phelps Dodge Copper Products Corporation, he is also a member of The Wire Association; Army Ordnance Association; American Institute of Electrical Engineers; National Security Industrial Association; and a member of the Advisory Committee of the National Production Authority and Office of Price Stabilization, Washington.

Howard T. Brinton * * * * * *

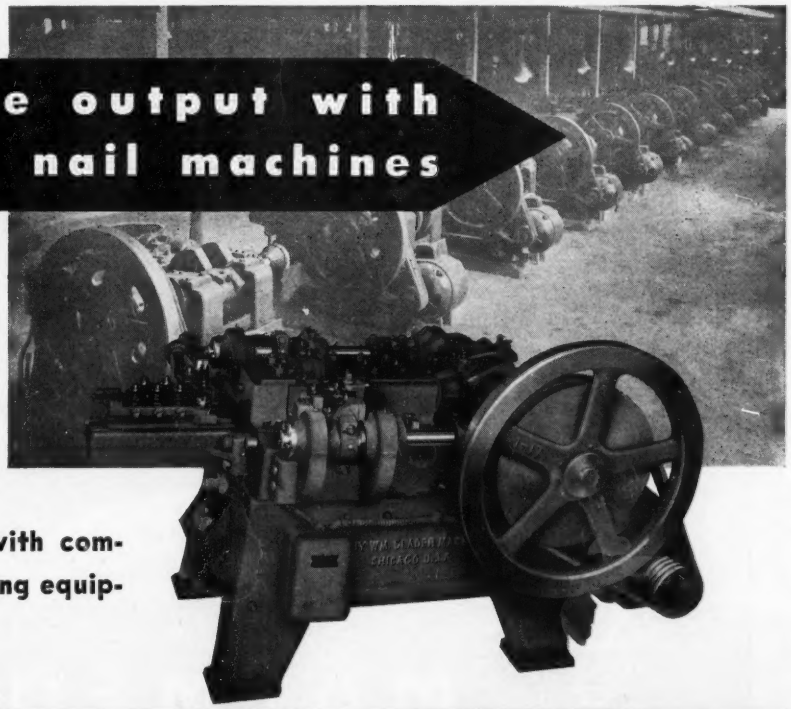
★ ★ ★

The Board of Directors also elected **W. J. Palmer,** Vice-President in charge of manufacturing. Mr. Palmer has been Works Manager of the Bayway plants of the Phelps Dodge Copper Products Corporation at Elizabeth, N. J., for a number of years.

★ ★ ★

Mr. Palmer came to the Bayway Mills of Phelps Dodge at Elizabeth as Superintendent of the Tube Mill having previously been Production Manager for Revere Copper and Brass Company at Rome, New York,

high tonnage output with GLADER wire nail machines

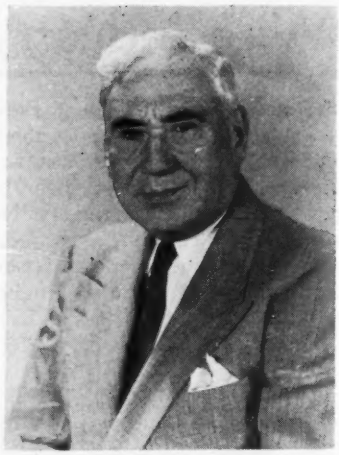


A size and type machine available to make everything from tacks and brads to 12" spikes with maximum efficiency.

Write for 12 page bulletin with complete information on nail making equipment.

WM. GLADER MACHINE WORKS 210 N. RACINE AVENUE CHICAGO 7, ILLINOIS

Export Dept.: 122 E. 42nd Street, New York 17, N. Y.



William J. Palmer

and Works Manager for Bridgeport Brass, which company he joined in 1919. He leaves the position of Works Manager of the two Bayway plants to make his headquarters at 40 Wall Street in New York.

★ ★ ★

John J. Conlon was named General Superintendent of the Bayway Mills. Mr. Conlon is Production Manager of the two Elizabeth plants.

Announces Opening Of Branch Sales Office

On October 1, 1952, **Federal Products Corp.**, Providence, R. I., opened a branch sales office to serve the Greater New York City Area, replacing the F. A. Brady Co. which, through Otto Mitler and Jack Frost, carried on faithfully for many years as their manufacturers representative.

★ ★ ★

This new branch office is under the management of **James G. Gunderson**, who has been with Federal 13 years, most recently in New England and upper New York State.

★ ★ ★

Robert A. Powell also works in this territory out of the new office. He has had wide experience as a design and development engineer and comes from the New England territory. His experience will be helpful in solving customers' measurement problems.

★ ★ ★

Transferred to Coast Staff

A. Milne & Company, nationwide distributors of solid and hollow tool steels, has announced the appointment of **James King Hoyt** as Assistant Western Manager, effective October 1, 1952.

★ ★ ★

He will make his headquarters at the company's San Francisco Office and Warehouse, 540 First Street, San Francisco, California.

★ ★ ★

Mr. Hoyt is a veteran of World War II, having served with the Navy during 1945 and 1946. He started with the company in 1949 and prior to his appointment as Assistant Western Manager was a member of Milne's Pittsburgh Sales Staff.

★ ★ ★

B. N. Clarke Appointed Surface Combustion Sales Engineer

The appointment of **Beresford N. Clarke** as sales engineer in the New England territory for **Surface Combustion Corporation** was announced by Henry M. Heyn, sales manager of Surface Combustion's Heat Treat Division. Mr. Clarke will be engaged in the sale of special furnace heat treat equipment, under the supervision of W. T. Fulton, district man-

ager, and will maintain headquarters in the Quincy, Massachusetts, office.

★ ★ ★

Mr. Clarke is a graduate of Purdue University and has been affiliated with Surface Combustion since his graduation in January, 1948. Prior to his assignment to sales activities he was engaged in technical development and service work.

Hooker Promotes Two Men

Hooker Electrochemical Company announces that **Alexander D. Kischitz** has been placed in charge of research technical literature, and that **Jerome Wilkenfeld** has been appointed supervisor of process study. Both men have been associated with the company since 1943.

★ ★ ★

Mr. Kischitz is a graduate chemist from the University of New Hampshire, and prior to his recent transfer, he had been a research chemist.

★ ★ ★

Mr. Wilkenfeld was graduated from City College of New York as a Chemical engineer. He has been employed in various departments, being transferred to the process study group in 1945. Prior to his recent promotion he has been a group leader.

★ ★ ★

New West Coast Plant For American Chemical Paint Company

The American Chemical Paint Company announces that it has acquired office and plant facilities on the West Coast and expects to be operating there about the first of November.

★ ★ ★

The new ACP plant is located at Niles, California—about 25 miles southeast of San Francisco. Present plans include the production of metal-working chemicals (rust proofing and paint-bonding phosphate coating chemicals, pickling acid inhibitors) and agricultural chemicals (plant hormones and "Weedone" weed killers).

★ ★ ★

Heading up the Niles' ACP branch will be **George H. Williamson,** for many years associated with the American Chemical Paint Company in a supervisory capacity at its Detroit, Michigan office. In addition, field representatives will provide technical servicing and consultation for ACP customers in the West Coast area.

Electric Furnace Incorporates Canadian Subsidiary

The Electric Furnace Co., of Salem, Ohio announces the incorporation of a subsidiary company in Canada to be known as **Canefco Limited,** with headquarters at 137 Wellington Street, West, Toronto 1, Ontario.

★ ★ ★

The officers of this new Canadian company are: **D. E. Moody,** President, **K. U. Wirtz,** Vice President, and **H. E. Farintosh,** Sec-Treas.

★ ★ ★

K. U. Wirtz, Vice President, is also president of The Electric Furnace Company at Salem, Ohio with which company he has been associated for over 25 years.

★ ★ ★

D. E. Moody and **H. E. Farintosh** have also had extensive experience in designing, developing and installing heat processing equipment.

★ ★ ★

Canefco Limited will design, erect, and put into operation both fuel fired and electrically heated industrial heat treating furnaces, special atmosphere generators, charging machines, and other auxiliary equipment in collaboration with the parent company.

NRM EXTRUDERS

Give you

FASTER, BETTER WIRE COVERING

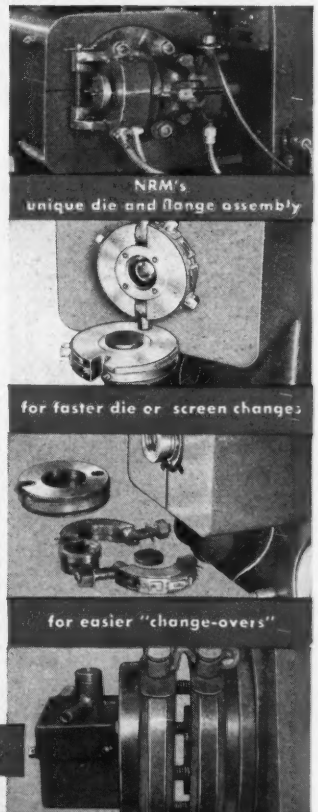
That's right!! NRM extruders have many features designed to give you faster, better covering of wire with plastics.

Take, for instance, NRM's die and front flange assembly—an exclusive feature—engineered to save you time, money, and effort—designed to give you better extrusions through exacting heat control.

Simple and sturdy . . . this assembly swings open quickly — dismantles easily — permits faster die and screen changes and easier "change-overs" from one plastic to another.

Furthermore . . . both the die gate adapter and the flange carry exterior band heaters which eliminate critical heat losses and give more uniform extrusions. For Nylon extrusions, the flange can be completely removed and the Nylon die or crosshead, with heaters, mounted directly on the cylinder face. Such a mounting also permits controlled heating and exact extrusions.

NRM's unique die assembly is now available on its 1½", 2½" and 3½" electrically heated plastics extruders. Write, today, for more information on this and all the features of NRM extruders.



2026

NATIONAL RUBBER MACHINERY CO.

General Offices & Engineering Laboratories: Akron 8, O.
East: 1180 Raymond Blvd., Newark, N. J.
West: S. M. Kipp, Box 441, Pasadena 18, Calif.
Export: Omni Products, 460 4th Ave., New York 16, N. Y.

Creative Engineering

A New Federal
TAKE-UP

complete with

COILING HEAD

FEATURING

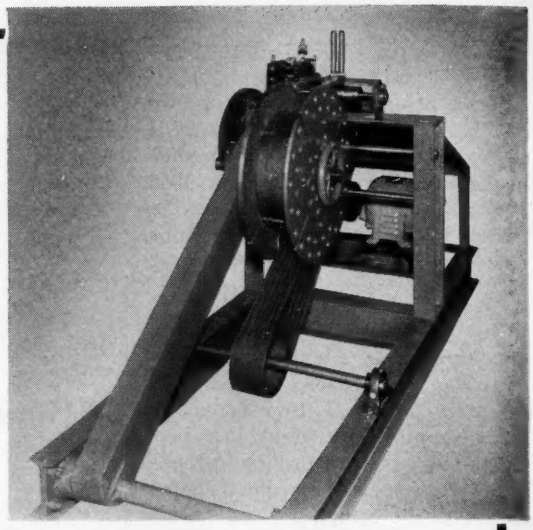
1. Built to meet your requirements;
2. 3 to 1 speed ratio;
3. Traverse with variable speed and variable pitch.

For information, write to

Federal Manufacturing Co.

SPECIAL WIRE MACHINERY

236-240 *Hall Avenue, Wallingford, Conn.*



FEDERAL EQUIPMENT

CAPSTANS	CORD SET TESTERS
PAY-OFFS	SPECIAL TESTING
TAKE-UPS	EQUIPMENT
LACQUER TOWERS	MEASURING
ELECTRODES	MACHINES

SPARK TESTERS

MEYER, ROTH + PASTOR

MASCHINENFABRIK

KÖLN-RADERBERG

GERMANY

A new

Universal Multi-Slide Bending Machine

for the full-automatical and economical manufacture of mass-produced articles of all kinds from wire and strip.

Special features:

- Vertical structure, covered construction, smallest space requirements.
- Bending slides positively moved and directly steered, therefore high output and fool-proof operation.
- Exact wire feed by a special steered pressing device.
- Simple shaped tools, easy to supervise, to adjust, and to exchange.
- Possibility to use further slides for unusual bending shapes.
- Additional equipment for stamping, punching, and piercing.

Please enquire for our detailed catalogue-sheet which will inform you about working ranges and employments of our Multi-Slide Bending Automatics.

The Electric Furnace Co., which has made a number of outstanding installations in prominent Canadian plants, is internationally known, and is probably the largest company in the world engaged exclusively in designing, building and installing large industrial electric and fuel fired production heat treating equipment. The company was originally established in 1911, and was incorporated at Salem, Ohio, in 1923.

★ ★ ★

Cowles Elects New Secretary-Treasurer

William M. Clossey has been elected Secretary and Treasurer by the board of directors of **Cowles Chemical Company,** Cleveland, Ohio.

★ ★ ★

Mr. Clossey was Secretary and Treasurer of Broadhead Garrett Company in Cleveland just prior to joining Cowles and before that was a supervising accountant for Ernst & Ernst. He is a member of the Ohio Society of Certified Public Acountants.

★ ★ ★

Sanford Stephenson

Sanford Stephenson, Manager of Wire Product Sales for the **Bethlehem Pacific Coast Steel Corporation,** San Francisco, California, passed away on August 18th. He was well-known in the Pacific Coast area and had been a member of The Wire Association.

* * *

L. J. Ross Reelected President, Torrington Co.

Directors of the **Torrington Company** have reelected **Lester J. Ross,** president. The company's official announcement also lists other executives chosen as follows: executive vice president, **Alfred W. Burg;** vice presidents, **Walter C. Thompson** and **Milton E. Berglund;** secretary, **W. Weston Blelock;** treasurer, **Floyd A. Peace;** assistant treasurer, **Ray E. White.**

★ ★ ★

The directors at their meeting also voted a quarterly dividend of 50 cents a share, payable October 1st, on stock of record September 22nd.

★ ★ ★

Pennsalt Names McWhirter Wyandotte Works Manager

James M. McWhirter, formerly Southern Works Manager for the **Pennsylvania Salt Manufacturing Co.,** has been appointed Manager of the Wyandotte Works, it has been announced by W. F. Mitchell, Vice President.

★ ★ ★

Mr. McWhirter replaces G. A. Nelson, who, because of his wide background and experience in electrochemical engineering, is being assigned to general engineering and consultative work in connection with Pennsalt's current expansion and plans for future developments.

★ ★ ★

Mr. Nelson has played a very important role in some of the company's most profitable developments in chlorine and caustic soda production and in several other fields of electrochemistry.

★ ★ ★

Mr. McWhirter has had broad experience with the company and in industry. Coming to Pennsalt from the General Chemical Co. in July, 1945, he was assigned first to the Natrona, Pa., plant. He was named Superintendent there on January 1, 1946. He assisted in engineering Pennsalt's hydrofluoric and sulfuric acid operations at Calvert City, Ky.,

When wrapping your wire or rod

...REMEMBER

It's the Crinkle in the PAPER that COUNTS!

For a tighter, more compact wrap, specify—
***"Arksafe"* CRINKLED KRAFT WIRE WRAP**

Easy to handle, simple to apply. Uniform crepe—Strong and *Economical*, too!

CONSTRUCTION: Single ply, waxed, asphalt laminated and reinforced.

In Standard Rolls and Widths for use on all types of wrapping machines. Also available in Hand Rolls.

For details, write Department WP-2.

ARKELL SAFETY BAG COMPANY
CHICAGO, ILLINOIS • NEWPORT NEWS, VIRGINIA
Distributed by: ADDISON ASSOCIATES
372 WASHINGTON STREET, WELLESLEY 81, MASS.

and became the first Superintendent of that plant when it began operations in June, 1949. He later was named Southern Works Manager, having supervision of Pennsalt plants at Calvert City; Montgomery, Ala.; and Bryan, Tex. **Ritner W. Tomlinson** was named to succeed him as Superintendent at the Calvert City plant.

★ ★ ★

It was also announced that **Herman J. Eichenhofer,** formerly Assistant Superintendent at Wyandotte, has been named Superintendent of Pennsalt's new electrolytic chlorine, caustic soda and hydrochloric acid plant, now under construction at Calvert City.

★ ★ ★

J. T. Gormally, formerly Superintendent of the Cornwells Heights plant, was appointed Assistant to the Production Manager and will make his headquarters in the Philadelphia office. **Frank J. Power,** Assistant Superintendent, becomes Acting Superintendent at Cornwells Heights.

Engineer Transferred To Sales By NRM

William G. Potts has been transferred from the Engineering Department to the Plastics Machinery Sales Department of the **National Rubber Machinery Company,** Akron 8, Ohio. While a member of the NRM Engineering Department he was assigned to the Plastics Machinery Section.

★ ★ ★

Mr. Potts attended the University of Akron and he joined NRM in 1940. During World War II he served three and one-half years in the Army Air Force.

Chase Metal Works Names New Works Manager

George Sengstacken, general superintendent of the Chase Metal Works, has been promoted to the position of works manager, succeeding **Walter L. Smith,** whose election as vice president and board member was announced last week by the **Chase Brass & Copper Company.**

★ ★ ★

The announcements by the board also includes the appointment of **F. G. Parker** as general superintendent of the Metal Works. **Oliver Atkin** has been made superintendent and **Theodore Drabers,** former process metallurgist, assistant superintendent.

★ ★ ★

Mr. Sengstacken has been associated with Chase Company for 43 years.. Starting as a clerk in the wire mill, he was made assistant foreman in 1911 and foreman of the Chase Metals in 1915. His appointment as superintendent of the rod and wire mills was made in 1934 and as general superintendent in 1944.

★ ★ ★

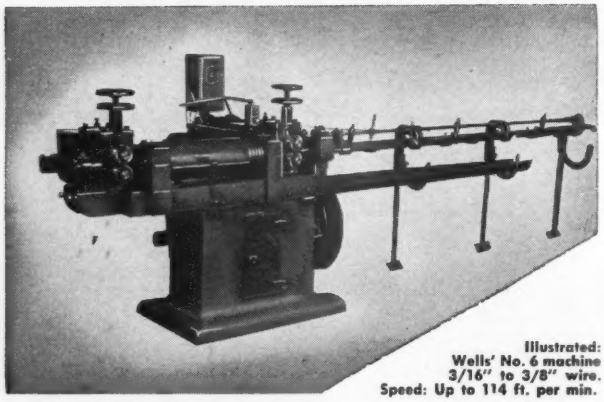
Mr. Parker, new general superintendent, joined Chase's in 1929 as research assistant. He was made superintendent of casting and allied departments in March, 1936.

Becomes Rod Mill Superintendent

G. T. Goodwin who has been acting rod mill superintendent since June, 1951, was recently made rod mill superintendent of the Newcastle Steel Works of the **Broken Hill Proprietary Co., Ltd.,** Australia. He started with the company

STRAIGHTEN and CUT SMALL WIRES

ON FAST, DEPENDABLE WELLS' AUTOMATIC ROTARY MACHINES



Illustrated: Wells' No. 6 machine 3/16" to 3/8" wire. Speed: Up to 114 ft. per min.

THIS MACHINE WILL CUT wire accurately and fast in any length from 7½" up to 25', but must be ordered for the maximum lengths to be cut.

The straightener flier runs in ball bearings. Has 2 H. P. motor arranged for direct drive. Drive gears are located inside of the base. Illustration shows the flier and drive open to show mechanism.

Furnished with 2 sets of hardened tool steel dies.

WELLS' machines are backed by 58 years of experience and of constant effort to improve their efficiency.

The result for you is a line of straightening and cutting machines that will handle the toughest jobs, day in, day out, year in, year out, with little or no servicing. Customers report uniformly high satisfaction with the operation of their WELLS equipment.

Built in a complete range of sizes for all wire gauges.

send for Catalog No. 50 covering the full line.

Frank L. Wells Company

KENOSHA • 5821 Fifth Avenue • WISCONSIN

Builders of Fine Wire Working Machinery

in 1939 as a trainee in their electrical department, and in 1944 received a degree in electrical engineering. He continued his studies in the Newcastle Technical College, being awarded a degree in mechanical engineering in 1946. He has worked in various departments, and has progressed steadily to his present position.

★ ★ ★

Walter Noad, who spent four years in this country representing his company, returned to Australia last year and is now executive of the **Australian Iron and Steel Limited's Kembla Works,** a subsidiary. His place was taken here by **Ian Carne,** with offices at 100 Park Avenue, New York.

★ ★ ★

Elected Officer of Vaughn Machinery Company

Gordon C. Vaughn, formerly Chief Service Engineer of the **Vaughn Machinery Company,** Cuyahoga Fall, Ohio, was recently elected to the vice presidency of the company, which is well-known as a leading manufacturer of wire drawing machines, draw benches and accessory equipment used in the wire industry.

★ ★ ★

To Represent Hooker in Midwest

R. E. Wilkin, general sales manager, **Hooker Electrochemical Company,** has announced the appointment of **William L. Gillespie** as field salesman for Chicago and the Midwest area. Mr. Gillespie has been with the Hooker Company since 1939, having been in the development and research department in various capacities until 1950. Prior to his recent transfer, he had been in the sales department on technical service.

★ ★ ★

At the same time **Harold Wever** was transferred to technical sales service. Mr. Wever has been at Hooker since 1943 and had been in the development and research department of the company prior to his recent transfer.

A.S.&W. Elects Treasurer

Walter V. Farr has been appointed treasurer of **American Steel & Wire,** it was announced recently by Harvey B. Jordan, president of the U. S. Steel Division.

★ ★ ★

Mr. Farr, who has been assistant treasurer of the Wire Division in the Chicago District, will move to Cleveland to succeed **John J. Farrell,** who has been promoted to assistant treasurer of **United States Steel Company** in Pittsburgh, Pa.

★ ★ ★

In February 1934 Mr. Farr first became associated with the Wire Division as a property appraisal clerk. With the exception of two years from 1935 to 1937, when he served with a private accounting firm, Mr. Farr advanced through the ranks of the Wire Division, becoming audit supervisor in 1938. He was made assistant treasurer in 1945.

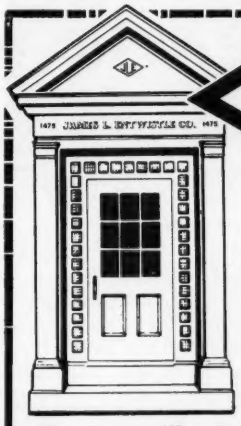
★ ★ ★

Appoints Eastern Representative

Diamond Tool Research Co., Inc., manufacturers of resinoid bonded diamond wheels, diamond tools and diamond powder, announce the appointment of **G. J. Seifert** of Matawan, New Jersey, to represent this company in Southern New Jersey, Eastern Pennsylvania, Delaware and Maryland.

★ ★ ★

(*Please turn to page* 1220)



JLE

SERVING THE WIRE INDUSTRY THROUGHOUT THE WORLD

- Caterpillar Pull-outs
- Standard Sets of Spark-Testing Equipment
- Take-ups and Re-spoolers
- Reelers
- Coilers
- Spoolers
- Collapsible Coiling Reels
- Wire Sparkers and Accessories
- Hand Locators
- Electrode Units and Stands
- Measuring Machines, Counters and Accessories
- Wire Guide Units
- Pay-off Reels Stands
- Electronic Devices
- Shaftless Take-ups and Payoffs
- Wire Pre-Heater
- Disk Brakes and Controls, Drag Units and Slip Clutches
- Wire Marking Machines, Type Strips, Inks
- Labelling Machines
- Pneumatic Equipment and Controls
- Special Machinery for the Wire Industry
- Hydraulic Equipment and Controls
- Hi-Pot Test Sets
- Cable Handling Equipment for Warehouse Use

See page 1172 for News of the JLE "Caterpuller"

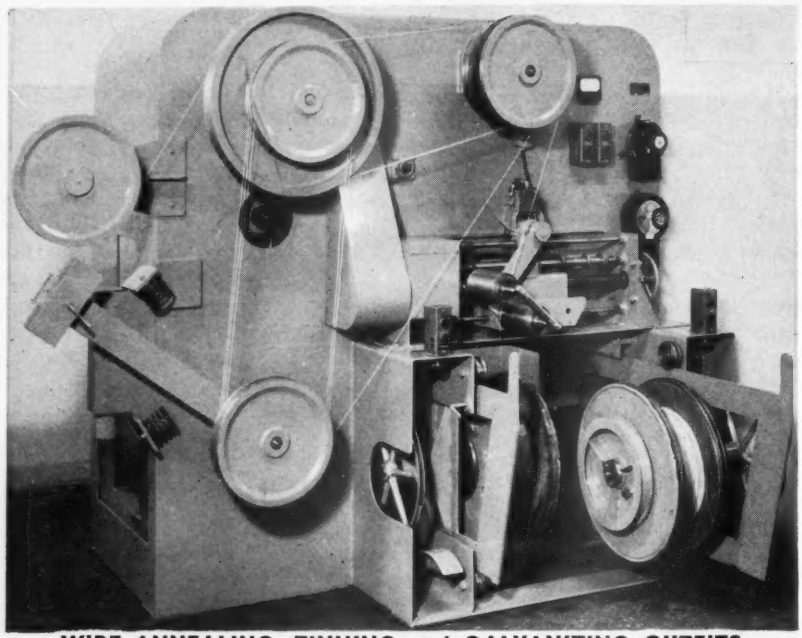
JAMES L. ENTWISTLE CO.

1475 ELMWOOD AVE. PROVIDENCE 7, RHODE ISLAND, U. S. A.

European & South American Agents:
M. CASTELLVI, INC.
150 BROADWAY, NEW YORK 38, NEW YORK

British Associate:
GENERAL ENGINEERING CO., LTD.
BURY ROAD, RADCLIFFE, LANCASTER, ENGLAND

JLE - JLE - JLE - JLE - JLE



CAPSTAN AND DOUBLE TAKE-UP FOR CONTINUOUS OPERATION

WIRE TAKE-UP TENSION, ONCE SET, IS CONSTANT THROUGHOUT REEL BUILD-UP.

REELS INDIVIDUALLY MOTOR DRIVEN.

MACHINE BALL BEARING MOUNTED THROUGHOUT.

WIRE ANNEALING, TINNING and GALVANIZING OUTFITS
MULTIPLE or SINGLE UNIT WIRE TAKE-UPS
FINE WIRE DRAWING MACHINES
MAGNET WIRE ENAMELING EQUIPMENT, INCLUDING PRE-ANNEALERS, SYNTHETIC ENAMEL APPLICATORS and CIRCULATING SYSTEMS
COTTON, GLASS-FIBER and TAPE COVERING MACHINES

EST. 1855 AIMCO INC. 1915

"American" INSULATING MACHINERY COMPANY

REG. U.S. PAT. OFF.

FAIRHILL AND HUNTINGDON STREETS

PHILADELPHIA 33 PENNSYLVANIA U.S.A.

(ILLUSTRATED)
42" x 20" x 21"—(4000# cap.)

HEAVY DUTY

BREAK-DOWN REELS

1000#
2000#
4000#
} capacities

Rugged Design including patented DURA-CURL rim, and many other features necessary to provide the *Strength* and *Durability* needed for continued successful performance.

Also complete line of sizes of Modern High Speed Wire Drawing NO-CREV Spools and Reels for both fine and intermediate size wire.

MOSSBERG PRESSED STEEL CORP.

18 WEST STREET
ATTLEBORO, MASSACHUSETTS, U.S.A.
Telephone Attleboro 1-0847 & 1-0848

James Day (Machinery), Ltd., 28 Maddox Street, London, W. 1. England

#103

A Review of Recent Wire Patents

No. 2,609,087, MECHANISM FOR DRAWING WIRE, patented September 2, 1952 by Edwin J. McIlvried, Cuyahoga Falls, Ohio, assignor to The Vaughn Machinery Company, Cuyahoga Falls, Ohio, a corporation of Ohio.

Associated with a spindle is a drawing drum comprising axially adjacent parts each slip-fitted on one end of the spindle and an annulus between the juxtaposed faces of the parts defining therewith a peripheral groove around which wire is adapted to be wrapped, axially extending screws within the drum but radially outward of the spindle for drawing the parts together to frictionally clamp the annulus therebetween whereby the parts and annulus may be axially slipped onto and off the spindle as a unit. The drum is nonrotatably secured on the spindle at a desired axial position.

★ ★ ★

No. 2,609,088, WIRE DRAWING MECHANISM, patented September 2, 1952 by Edwin J. McIlvried, Stow, Ohio, assignor to The Vaughn Machinery Company, Cuyahoga Falls, Ohio, a corporation of Ohio.

An anti-vibration device is provided for resiliently contacting a vertically travelling stretch of wire between a die and a wire drawing capstan to eliminate marks on the wire caused by vibration thereof when drawn through the die.

★ ★ ★

No. 2,609,159, WIRE BUNDLING MECHANISM, patented September 2, 1952 by Norman H. Nye, Cuyahoga Falls, Ohio, assignor to The Vaughn Machinery Company, Cuyahoga Falls, Ohio, a corporation of Ohio.

In wire bundling mechanism the inventor provides, with a vertically disposed draw block operative when rotated to draw wire thereonto and form such wire into a coiled bundle which moves upwardly along the block as it grows, light sensitive target elements to cause operation of means to stop the upward movement of the coil.

★ ★ ★

No. 2,609,163, COIL WINDING APPARATUS, patented September 2, 1952 by Joseph LaCesa, Chicago, Ill.

There are 15 claims to this apparatus which includes a wire-laying carriage operated by electro-magnetic means.

★ ★ ★

No. 2,609,302, RUST INHIBITING MATERIAL, patented September 2, 1952 by Howard N. Copthorne, Winnetka, Ill.

A reacted mixture comprising from approximately 40% to 75% by weight of a mixture of fatty acids each having not less than sixteen carbon atoms in its molecular structure, from approximately 22% to 53% by weight of lead oxide, and from approximately 2.5% to 7% by weight of sulphur at a temperature below 500° F., is provided as the inhibitor.

★ ★ ★

No. 2,609,825, HAIRPIN, patented September 9, 1952 by Anthony V. Richetti, Jamestown, N. Y.

This hairpin is formed of flattened wire and has a pair of legs and bight portion, one of the legs being formed with a series of uniformly spaced elongated slots arranged in the direction of the leg length and extending from adjacent the resilient part of the leg end, while the other leg has a series of undulations adapted to interfit the slots.

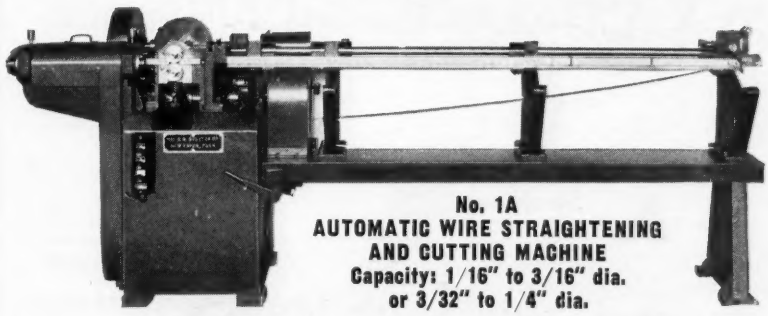
★ ★ ★

No. 2,609,865, SPRING STRUCTURE, patented September 9, 1952 by Arless J. Horton and William D. Gaston, Hickory, N. C.

A coiled spring unit for the back frame of an upholstered chair, sofas, and the like is provided, a number of spaced rows of coiled springs, a border wire surrounding the rows of coiled springs, a number of coiled wires disposed around the border wire and being interlaced with the outer edges of the front ends of the coiled springs, and a number of coiled wires extending transversely of the unit and each coiled wire being interlaced with the proximate edges of the front ends of the coiled springs.

★ ★ ★

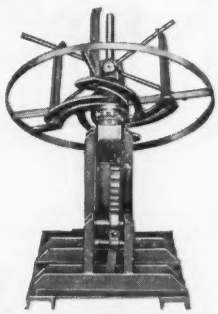
A "SHUSTER" *automatically* boosts production in wire-using plants!



No. 1A
AUTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE
Capacity: 1/16" to 3/16" dia. or 3/32" to 1/4" dia.

Wherever a Shuster is installed, production increases as high as 75 percent have been recorded. Shusters take wire from coil stock, then straighten and cut it to accurate lengths, all in a smooth, precision operation noted for the almost continuous wire travel. Once set, Shusters require little attention beyond keeping them supplied with coils.

Sizes available for .025" to 11/16" dia. wire; shapes, flat stock, tubing. Write us your requirements.



SHUSTER WIRE REELS
The counterbalancing weight does practically all the lifting, permitting one man to raise the heaviest coils of wire to the operating position.

Mfd. by **METTLER MACHINE TOOL, INC.**
132 W. Lawrence St., New Haven, Conn.
Representatives in all principal cities and in foreign countries.

SHUSTER *Automatic* Since 1866 WIRE STRAIGHTENING AND CUTTING MACHINES

No. 2,609,937, JOINT STRUCTURE FOR WIRE DISPLAY RACKS, patented September 9, 1952 by Harry J. Rubenstein, Kansas City, Mo.

The rack is constructed mainly of heavy wire or light rod material.

★ ★ ★

No. 2,610,009, WOVEN WIRE FENCING, patented September 9, 1952 by Frank J. Mafera, Raymond, N. H.

Woven wire fencing is provided including a number of wire units extending in overlapped relation transversely of the fencing, each unit embodying two spaced wire strands extending in spaced zig-zag paths transversely across and connected at the margins of the fencing, the two strands of each unit respectively overlapping two adjacent units and the two adjacent strands of the two adjacent units extending around and interlocking with each other at the adjacent apices of their zig-zag paths.

★ ★ ★

No. 2,610,334, MATTRESS CONSTRUCTION, patented September 16, 1952 by James Piliero, Astoria, N. Y., assignor to The Englander Company, Inc., Chicago, Ill., a corporation of Delaware.

This mattress includes an upper body of resilient cellular material having a marginal recess extending continuously about the sides and ends thereof, an inner spring structure including a series of springs supporting the upper body inwardly of the recess, a border row of coil springs, surrounding the series of springs and disposed with their upper ends located in this marginal recess and supporting the outer portions of the upper body above the marginal recess.

★ ★ ★

No. 2,610,846, PACKING RING, patented September 16, 1952 by John C. Hanna, Chicago, Ill., assignor to Hanna Engineering Works, Chicago, Ill., a corporation of Illinois.

The ring comprises a wire coil spring with the coils arranged so that it will yieldably oppose compressive forces in the direction of its axis.

★ ★ ★

No. 2,610,919, RUST INHIBITING COMPOSITION, patented September 16, 1952 by Milton P. Kleinholz, East Chicago, Ind., assignor to Sinclair Refining Company, New York, N. Y., a corporation of Maine.

Consisting essentially of a mineral oil as its base and about 1-2% calcium mahogany sulfonate and about 0.5-1% of a material of the group consisting of alpha-hydroxy lauric acid and the product resulting upon partial self-esterification of such acid and which contains in admixture the acid, the semi-lactide esterification product of the acid, and a relatively minor proportion of the lactide esterification product of the acid, the composition is adapted for iron and steel.

★ ★ ★

No. 2,610,926, METHOD AND APPARATUS FOR COATING WIRE WITH LIME, patented September 16, 1952 by Charles R. Chase, Morrisville, and George L. Bliss, Yardley, Pa., assignors to United States Steel Company, a corporation of New Jersey.

There are seven claims circulation of the liquid and solids therein take place below the travelling wire in the bath.

★ ★ ★

No. 2,611,868, BROADBAND HELICAL ANTENNA, patented September 23, 1952 by Arthur E. Marston and Mack Donald Adcock, Washington, D. C.

A high frequency circulatory polarized antenna is disclosed in this patent, constructed of helical interwoven wires.

★ ★ ★

No. 2,611,910, MATTRESS COIL SPRING UNIT, patented September 30, 1952 by Sam Bell, Milwaukee, Wis.

Groups of two associated coil springs are provided, the outer convolutions of which having bent portions and free ends, the free ends of the convolutions of one coil spring extending to and engaging with the bent portions of the convolutions of the other of the coil springs, whereby relative movement of the ends of the outer convolution of one coil spring and the free ends of the outer convolutions of the other coil spring is prevented.

★ ★ ★

No. 2,611,945, METHOD OF RUST-PROOFING IRON AND STEEL REINFORCING ELEMENTS FOR STEAM CURED CONCRETE, patented September 30, 1952 by Lennart Hans Simonsson, Stockholm, and Leo Torsten Ulfstedt, Sodertalje, Sweden, assignors to Internationella Siporex Aktiebolaget, Stockholm, Sweden, a company of Sweden.

The method is said to cause the lime and siliceous components of the coating to react with each other and set, producing a tight waterproof joint between the reinforcing elements and the concrete.

★ ★ ★

No. 2,612,004, UNIDIRECTIONAL WIRE GRINDER OF THE DRAGGED WORK-PIECE TYPE AND METHOD, patented September 30, 1952 by Louis Illmer, Cortland, N. Y.

A strand processing machine is divided, comprising a driven tractor reel including

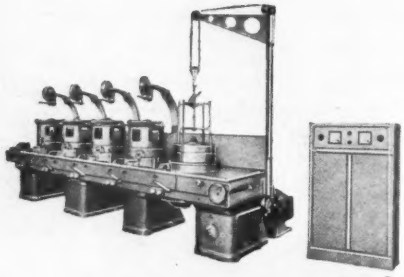
EW

Wire Drawing Machines, working on the dry or wet method (soap powder or by immersion) for iron, steel, copper, aluminum and other metal wires.

Metal Wire Cloth Weaving Looms (fly & mosquito nets, sieves, plastering work, etc.)

Automatic Straightening and Cutting Machines

Machines for producing: Wire nails and wire tacks, rivets, iron & wood screws, small nuts, welded and non-welded chains, knotted chains, barbed wire, wire pins, safety pins, hair clips, spokes and nipples for bicycles, etc.



EMILIO WARTENWEILER,

MILAN (Italy), Via Pergolesi, 18.

Tel. 21 245

a rim adapted to have a group of strand coils spirally trained thereon, a cutting tool arranged to superficially treat a reel oncoming strand portion as a workpiece, separate stators respectively located adjacent to each rim end, stator sustained rollers reversely assembled upon each stator, one of the rollers serving to laterally thrust the last laid rim coil axially of the reel and the other roller being disposed to counteract the thrust imposed upon the rim by the first roller.

★ ★ ★

Heat-Resistant Industrial Gloves

All-leather heat-resistant gloves, said to be able to "take temperatures up to 800° F.," are described and pictured in a new bulletin offered by the distributor, **Mine Safety Appliances Company,** Pittsburgh 8, Pa.

* * *

The gloves, manufactured by Liberty Dressing Company, Gloversville, N. Y., are pliable, durable, comfortable and economical. They are the development of nearly 10 years of research, the bulletin states. Soft, flexible leather impregnated with insulating and refractory materials is used. Inseam construction guards the threads against undue wear. The inner lining, of selected leather, is sewn into finger tips to prevent separation when gloves are removed from perspiring hands. Models featured in the bulletin are 113G for temperatures up to 500°F., 213G with reinforced pre-shrunk palm up to 800° F., extra-long (13-inch) models, and outseam reversible mitts of similar construction.

★ ★ ★

The bulletin will be sent upon request by Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

★ ★ ★

Chase Brass To Build Warehouse At Chicago

Ground was broken in September for a two story office and warehouse building to be erected by the **Chase Brass & Copper Company** at the southwest corner of Grand and Long Avenues, Chicago. The new structure, with 53,000 square feet, will be about twice as large as the space now occupied at 1300 West Harrison Street.

★ ★ ★

The company has acquired 150,000 square feet of ground at the new address which will provide ample future expansion.

★ ★ ★

Rapid growth of the company makes the expansion necessary to carry the present stocks of brass and copper sheet, rod, tube, and wire required to service customers in Illinois, Iowa and Indiana.

★ ★ ★

G. T. Underhill, Mid-Western manager, has headquarters in Chicago. **Wallace L. Brown** is district manager in charge of Chicago operations.

Sjogren Tool Altering Offices

Construction on new offices for the **Sjogren Tool and Machine Co.,** Auburn, Mass., is under way, and when the alterations and enlargements are completed they will have a new entrance, new reception room, new front office and a larger and better engineering office.

★ ★ ★

The company is well known as manufacturers of wire grips, casting machines, wire spoolers, pointing dies, cage rollers, swaging hammers and other items.

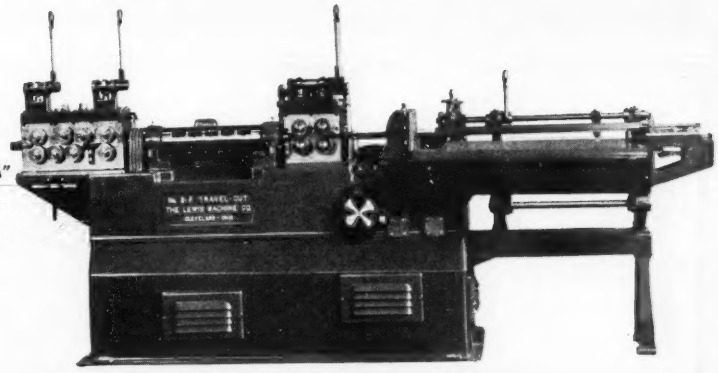
Reliance M-G Sets Discussed in New Booklet

Engineered motor-generator sets for all industries form the subject of a new, 4-page, illustrated bulletin

Fast, Accurate, Economical

STRAIGHTENING and CUTTING

with LEWIS **TRAVEL-CUT**



22 Models to handle from 1/16" to ¾" Round, Hex, Flat, Shapes.

Simple in design, rigid in construction, Lewis TRAVEL CUT will deliver continuous dependable service under the most severe, high production conditions—day in, day out. Feeds wire from the coil, straightens accurately, gauges to uniform length, and cuts clean without stopping the wire. For steel, brass, aluminum and alloy wire. Cut your cutting costs with the Lewis TRAVEL CUT. Full details on request.

Exclusive Representatives

EAST: Penn Machinery Co., 117 North Third Street, Philadelphia 6, Penn.

MIDDLE WEST: Steel & Wire Machinery Co., 15457 Euclid Ave., Cleveland 12, O.

CENTRAL: Moslo Machinery Co., 2442 Prospect Avenue, Cleveland 15, Ohio.

WEST COAST: Hoffman & Heartt, 3005 So. Grand Ave., Los Angeles 7, California

CANADIAN: Empire Engineering Co., 11 Wellington St. E., Toronto 1, Ontario.

CONTINENTAL EUROPE: Gaston E. Marbaix Ltd., Devonshire House Vicarage Crescent, London S. W. 11, England.

The LEWIS MACHINE Company

3441 E. 76th Street, Cleveland 27, Ohio

Also agents in Paris, Stockholm, Rotterdam, Brussels, Zurich, Milan, Bombay and Melbourne

WAFIOS

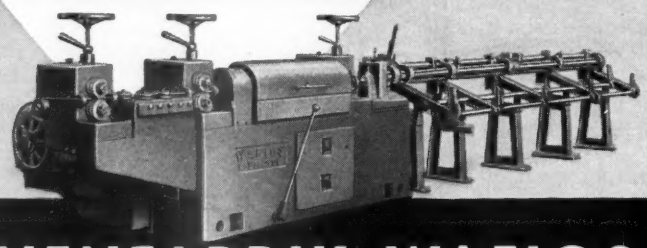
WIRE-WORKING MACHINERY

Wire Netting Machines for Chain Link, Hexagonal Mesh, Poultry Netting, Field Fence. Crimping, Barb Wire and Staple Machines. Spring Coilers. Spring End Grinding Automatics. Loop Benders. Upholstery Spring and Wire Mattress Machines. Wire Nail Machinery. Chain Formers. Chain Welders. Straightening and Cutting Machines. Multi-Slide Wire and Strip Forming Machines. Special Machinery for the making of Paper Clips, Lock Washers, Bale Ties, Key Rings, Tin Openers, Wire Bag Ties, etc. Automatics for Flexible Metallic Tubing.

Sole Agents for Australia and New Zealand: Bliss & Reels Co. Pty. Ltd., 64-66 Little Bourke Street, Melbourne C. 1, Australia.

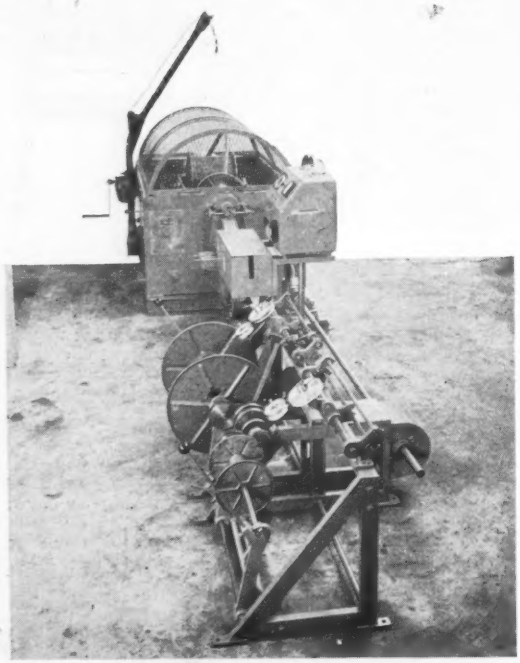
WAFIOS

SINCE 1893



MASCHINENFABRIK WAFIOS

WAGNER, FICKER & SCHMID **REUTLINGEN 3 / WÜRTT. GERMANY**



See Our

HORIZONTAL TWINNER

- **HIGHLY PRODUCTIVE**
  - —800 lays a minute
  - —Large drums:

  Pay-off: 16 & 24" flange diameter

  Take-up: up to 42"
  - —double take-up assembly.
- **SURE**
  - —tension easy to balance
  - —equipped with a sparker device
  - —stopping for a predeterminate length.
- **EASY TO USE**
  - —Lays from 2" to 6"
- **ESPECIALLY EFFICIENT FOR MILITARY TRANSMISSION CABLE.**

POURTIER MACHINES

153, rue Galliéni

ROMAINVILLE **Seine (FRANCE)**

(F-2502) just issued by the **Reliance Electric & Engineering Company,** Cleveland, Ohio.

★ ★ ★

Briefly described is the complete line of "custom-tailored" M-G Sets —shunt or compound wound, from ¾ to 1,000-kw—built by Reliance to provide power for constant-voltage or adjustable-voltage systems and engineered to include synchronous or induction motors.

★ ★ ★

Also included are six typical applications of Reliance M-G Sets showing their utilization for large single-motor drives, excitation of synchronous machinery, multi-motor drives, and "spot conversion," an economical means of supplying D-C power at the point of use.

★ ★ ★

Copies of this interesting, informative bulletin are available on request. Write to the Reliance Electric & Engineering Company, 1088 Ivanhoe Road, Cleveland, Ohio.

Gaillard Seminar, January, 1953

Dr. John Gaillard, mechanical engineer on the staff of the American Standards Association and lecturer at Columbia University, will hold his next five-day private seminar on industrial standardization from January 26 through 30, 1953, in the Engineering Societies Building, 29 West 39 Street, New York City.

★ ★ ★

The Gaillard Seminars were started in 1947 upon request from companies for assistance in the organization of their standardization work and the training of their men in writing standard specifications. The total attendance so far has been 158 representatives from 98 organizations. The average seminar group has consisted of 14 men.

★ ★ ★

The session will consist of ten conferences, one in the morning and one in the afternoon, Monday through Friday. At each conference a subject on the seminar program will be presented by Dr. Gaillard and then discussed around the table.

★ ★ ★

For further details and registration write to Dr. John Gaillard, 400 West 118 Street, New York 27, N. Y., or phone him at the ASA office, MUrray Hill 3-3058.

Dillon Removes Business to California

W. C. Dillon & Co., manufacturers of testing apparatus, tension gauges and other equipment, have moved from Chicago to 14,620 Keswick St., Van Nuys, California—a suburb of Los Angeles.

★ ★ ★

The new plant contains 12,000 square feet of floor space and is located on a 2 acre piece of ground. Emphasis has been placed on a new laboratory in which ideas and new equipment can be developed.

★ ★ ★

An unusual fact in the company's management is that it is vested in a father and six sons—the Dillons believe that this is unique. All hold patents in their own names, although Mr. Dillon, Sr., now 74, leads the boys in this respect.

NOPCO Using Improved Drum Design

Off the automatic conveyor and into the transportation company's giant trucks has rolled the first load of **Nopco Chemical Company's** newly adopted "dressed up" drums.

★ ★ ★

The swing-over to the more distinctive, colorful package by the Harrision, New Jersey, concern promises a two-fold advantage to Nopco customers. The black drum with its brilliant golden-yellow center band will make quick identification of Nopco products possible in customers' plants and warehouses. Additional stencilling of all-important shipping marks on the bung sides of the drums, as well as on the heads, is expected to prove a distinct advantage, particularly to those customers who are warehous-

---

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

WIRE AND WIRE PRODUCTS (Insert exact title of publication) published MONTHLY (State exact frequency of issue)

at ORANGE, CONN. (Name of post office and State where publication has second-class entry) for YEAR 19 52

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

	Name	Address
Publisher	RICHARD E. BROWN	455 MAIN STREET, STAMFORD, CONN.
Editor	EDMUND D. SICKELS	455 MAIN STREET, STAMFORD, CONN.
Managing editor		
Business manager	RUTH S. SPENGEL	455 MAIN STREET, STAMFORD, CONN.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Name	Address
QUINN-BROWN PUBLISHING CORPORATION	455 MAIN STREET, STAMFORD, CONN.
RICHARD E. BROWN	455 MAIN STREET, STAMFORD, CONN.
LETA B. BROWN	2542 SUMMIT ROAD, MONTECITO, CAL.
RUTH S. SPENGEL	455 MAIN STREET, STAMFORD, CONN.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

Name	Address
NONE	NONE

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

R D Spengel
(Signature of [illegible], business manager, or owner)

Sworn to and subscribed before me this 9th day of Sept 1952

[SEAL]

Carl R Martino

(My commission expires April 1956)

16—18720-6

ing in palletized units.

★ ★ ★

Nopco officials, in announcing adoption of the new drum design, state that extensive use of the drums has begun and that all existing drums will soon be replaced with them.

Electric Wire Firm Increases Production With New Drying Heaters

The replacement of electric ribbon resistors with gas-fired unit heaters has made it possible for the **Holyoke Wire and Cable Corp.**, to secure a 50 per cent increase in the production of radio hook-up wire which is currently in wide demand throughout the radio, television, radar and related electronic industries.

★ ★ ★

This Massachusetts wire mill faced a difficult production problem during the early months of 1950. Radio hook-up wire, from 10 to 26 gauge, was selling in constantly increasing volume. Plant layout and equipment could keep pace with demand up to the point where a flame resistant lacquer was applied over the glass or textile covering. The lacquer room could not keep pace with the braiders, and hook-up wire production could not keep pace with sales.

★ ★ ★

In May, 1950, a gas-fired unit heater supplied by **The National Radiator Co.** was installed in the lacquer drying tower. Production immediately picked up. In July of that year another similar unit heater started to dry lacquer in a duplicate drying tower. A third unit heater, in a third tower, was put to work a few months later, and the knotty production problem was solved.

★ ★ ★

The three-heater schedule for lacquer drying is a 24-hour production day, 5 days a week, with 1,500 ft. of wire passing each minute out of the drying tower and on to the take-up reels. The fuel cost is approximately $5 per unit heater, per day.

★ ★ ★

A knowledge of some supplemental details behind this expedited production assist in gaining a clearer understanding of how the lacquer drying problem was solved.

★ ★ ★

Electric heaters in the drying towers provided an air temperature of only slightly above 100 deg. F. At this temperature, lacquer would dry satisfactorily — if it did not pass too quickly up and down the 25 ft. drying tower. When its travel was stepped-up, the lacquer was wet upon arrival at the take-up reel.

★ ★ ★

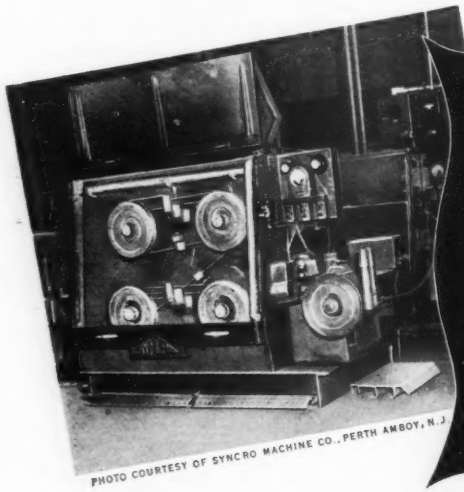
A step-up in speed was very desirable because any increase above five days' production of the braiding machines was putting pressure on the 6-day operation of the lacquer room.

★ ★ ★

The Series C gas-fired unit heaters, having 215,000 Btu. input per hour and 172,000 Btu. hourly output, are installed near the base of the drying towers. Fans on the units have been removed. Their air movement was unnecessary since an exhaust fan was required to dispel lacquer fumes from the towers.

★ ★ ★

Fire insurance regulations required that 10,000 cu. ft. of fresh air pass through the towers for every



NOPCO'S
DURPON*
Drawing Compounds
give
TWICE THE SERVICE
you can expect from
conventional compounds

Nopco's DURPON drawing compounds—specifically developed for wet drawing of nonferrous wire, rods and tubes—are all on the alkaline side, to assure optimum die life, and are natural lubricants.

But the special advantage these improved compounds offer is *emulsion stability*. For incorporated into each Durpon product is a stabilizing additive which prevents breakdown of the effective drawing ingredients when the bath becomes contaminated by dirt, small amounts of carry-over acid and metallic particles.

Because Durpon additives help maintain normal balance between soap and lubricant, the stability of the drawing emulsion during recirculation is increased and the useful life of the emulsion lengthened.

As a matter of fact, Nopco® Durpon compounds not only provide optimum lubrication, but retain their initial degree of performance for *twice as long* as conventional compounds.

If you draw nonferrous materials, Durpon compounds will assure you *better drawing results* and *reduced drawing costs*.

Immediately available are:

DURPON
for intermediate gauge wire

DURPON L
for heavy wire, rods, and tubes

DURPON FW
for fine wire

Fill out and mail the coupon. We'll send you a technical bulletin and trial-size order promptly.

®Reg. U.S. Pat. Off. *Trademark

NOPCO
EVOLVED THRU RESEARCH
NOPCO
CHEMICAL COMPANY
Harrison, New Jersey
BOSTON · CHICAGO · CEDARTOWN, GA. · RICHMOND, CALIF.

NOPCO CHEMICAL COMPANY, Harrison, New Jersey
Gentlemen: Please send me a copy of your Bulletin giving information about Nopco DURPON Drawing Compounds.
Name.....Title.....
Company.....
Address.....
City.....Zone.....State.....

DYKREX

Shaped Die

MACHINES

SHAPING MACHINE

For putting in angles on shaped dies. Made of cast iron with ground and finished base, it is equipped with reciprocating moving lapping holder which finishes each side of the die. The die work table can be turned to desired position. A set of ground and finished adapter rings is furnished with each DYKREX machine. A top guard and side metal guard protect the moving mechanism.

DYKREX AUTOMATIC SHAPING MACHINE

- Consists of motor driven feed for shaping machine
- Includes reversing switch and timing switch
- Can be attached to shaping machines now in use

DYKREX SIZING MACHINE

For Putting in Bearings on Shaped Dies

- Rugged cast iron construction
- Vertical operation
- Protective housing guards moving parts

DYKREX
"IT CORRECTS THE DIE"

Write for Full Information

Roos Tool & Mfg. Div.
DYKREX CORPORATION OF AMERICA
33-35 Bloomfield Ave., Newark 4, N.J.

gallon of solvent evaporated in the cable coating lacquer. This solvent representing 70% of the lacquer's content, produces fumes that are explosive in character.

★ ★ ★

An airstat, mounted in the hot air duct leading to the tower, controls the gas unit heater which is providing a 130-150 deg. F. air temperature to surround the lacquer coated wire as it passes repeatedly up and down in the drying tower.

★ ★ ★

According to E. S. Bartlett, vice president of Holyoke Wire and Cable, the installation of the new unit heaters broke a bottleneck which was becoming more serious each day; eliminated the necessity of installing a steam boiler in order to secure higher temperatures in the drying towers, and made it possible for the braiding room to work six days a week with the lacquering operations so expedited that they could be accomplished in five days per week.

Making Fine Wire Counter

What is said to be the first counter and measuring machine specifically designed for fine wire of .010″ diameter and smaller is being produced by the **Federal Manufacturing Company,** 236 Hall Avenue, Wallingford, Conn.

★ ★ ★

The new machine is an electromagnetic type, actuated by a switch in conjunction with an Alnico permanent magnet. In addition to measuring fine wire lengths accurately, it will also measure lengths of wire of any larger size. It is reported that this is, however, the first time that precise length measurements have been possible on fine wires. Patents on the design of the machine have been applied for. Tubing, both metallic and plastic, may also be measured on it.

★ ★ ★

The machine is equipped with a predetermined counter with remote controls and appropriate indicating devices, and can record lengths at speeds up to 5000 feet per minute. Other speeds that are desirable are available. The measuring machine can be placed anywhere on the wire in the production line and special models can be furnished for unique counting or measuring applications.

THE FACTS ON DRAWING COMPOUNDS FOR STAINLESS STEEL WIRE

When you dry draw stainless steel wire, the best results will usually be obtained with a granular, completely anhydrous, *metallic* soap manufactured from a high melting point fat.

In wet drawing on the finer sizes of stainless steel wire, a highly compounded mineral oil with suitable fat, sulphur and chlorine additives will insure the most satisfactory all-around results.

For dry drawing of stainless steel and other "tough" metals, Magnus Dri-Draw No. 4, a granular, anhydrous, metallic (calcium) base soap of a high titer fat has been giving dependable and outstanding service for many years. It provides a water-insoluble film of great tenacity and is highly resistant to heat.

For wet drawing the finer sizes of stainless, Magnus Drawing Oil No. 9 meets the compounding requirements noted above and does an outstanding job. It is a heavy duty oil containing oiliness and extreme pressure materials, including sulphur and chlorine. It is compatible with petroleum diluents, although it is generally used in the form received.

The cost of the drawing lubricant is by far one of the smallest of all production costs. Actually, it is merely the cost of the small amount of lubricant that is carried away by the drawn wire. The cost of a premium drawing lubricant can be more than justified by selecting one that materially reduces the over-all plant production costs.

The Magnus Chemical Company will be pleased to furnish you with any standard size container of drawing lubricant on a trial basis. Test it, considering all the factors which are of importance to the job. After this fair trial, if you do not feel that the Magnus Drawing Lubricant is more efficient than the competitive material in service, simply return the unused portion to us and we will cancel the invoice in full. It is understood that you are the sole judge . . . and there is no obligation. Magnus Chemical Company, 188 South Ave., Garwood, N. J. Adv.

WIRE DRAWING

FROM .0403" TO .005" (Not Annealed)

FERROUS and NON-FERROUS WIRES

SPECIALISTS IN:

- WIRE STRANDING
- BUNCHING
- SPOOLING
- BRAIDING

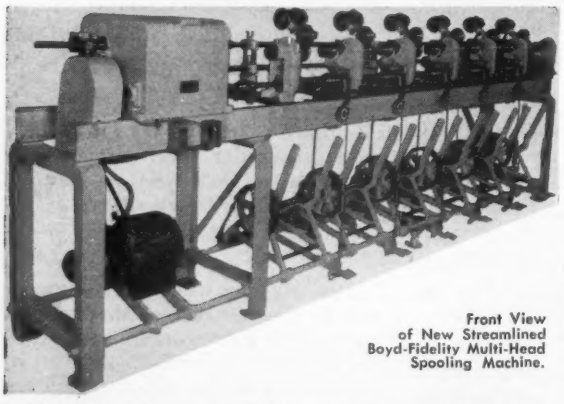
Please write to

BUY WITH CONFIDENCE — ANCHOR QUALITY

ANCHOR WIRE CORPORATION
183-16 JAMAICA AVE.
JAMAICA 3, LONG ISLAND, NEW YORK

A New and Improved . . . .

MULTI-HEAD SPOOLER



Front View of New Streamlined Boyd-Fidelity Multi-Head Spooling Machine.

This six-head spooler has a common traverse for all spindles. Each spindle is started independently by manual control and stopped automatically by a predetermined footage counter through a solenoid release clutch. The rate of traverse for different wire sizes is governed by easily changed gears. All parts precision made.

Will wind wire on spools up to 10" in diam. and traverse of ½" to 8". Furnished also to wind on wider spools, if desired, and with one to twelve spindles. Counter stop-motion, wire compensators and wire straighteners are optional equipment. Anti-friction bearings. Spindle speeds up to 1200 R.P.M. possible.

Send for full details.

BOYD & SONS MANUFACTURING CORPORATION

1434-38 Callowhill St., Philadelphia 30, Pa.

Hooker Forms Canadian Company

Formation of a new Hooker subsidiary, **Hooker Chemicals, Limited,** a British Columbia corporation, has been announced by **R. L. Murray,** president of **Hooker Electrochemical Company,** Niagara Falls, New York. The new company is acquiring a plant site of approximately 60 acres on Burrard Inlet in the District of North Vancouver, B. C. This project carries rights to lease adjacent tidelands with about 1000 feet on the channel providing deep water transportation for raw materials and finished products. The site will provide for the future manufacture of Hooker chemicals in this area. No definite plans have been made as to date or details of construction of this plant. Substantial tonnages of chlorine and caustic soda for the growing British Columbia pulp and paper industry are now being supplied from the Hooker Tacoma, Washington plant.

★ ★ ★

Hooker Electrochemical Company manufactures more than 100 industrial chemicals in its existing plants at Niagara Falls, New York; Tacoma, Washington; and Ashtabula, Ohio. Additional chlorine, caustic soda and ammonia capacity is being installed at the Tacoma, Washington plant. A large new Hooker plant is now under construction at Montague, Michigan.

★ ★ ★

Producing High Nickel Alloy Strip

High-nickel alloys, rolled to precision-tolerances and ultra-thin gauges, for use throughout industry, are now available from the **Industrial Division, American Silver Company, Inc.,** 36-07 Prince Street, Flushing 54, New York.

★ ★ ★

These metals (which include temperature compensation, low expansion, high permeability, glass sealing, and electrical resistor alloys), are now rolled to specifications by this company in strip up to 8 inches wide and down to .0005 inch thin — to tolerances as close as ± .0001 inch. The strip is available in any quantity from one pound to thousands of pounds.

★ ★ ★

The high-nickel alloys processed include: nickel-iron, nickel-chrome, nickel-cobalt-iron, and nickel-molybdenum-iron. The ultra-thin, high-

S. A. ETECO

ZWEVEGEM
(BELGIUM)

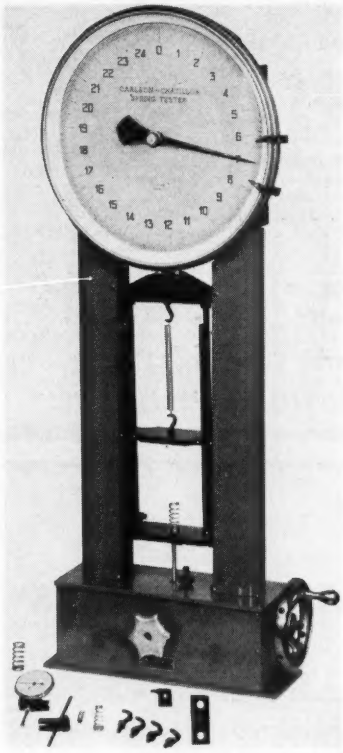
Selling Office for
Tréfileries León Bekaert,
S.P.R.L.

STEEL WIRES

precision metal strip is produced on precision 2-High, 4-High, and Sendzimir rolling mills; on precision gang slitters; and through continuous atmosphere annealing lines.

New Spring Tester For Small Springs

Loads and deflections of small compression and extension springs are accurately measured by this precision spring tester having a load range capacity from ½ oz. to 25 lbs.



The scale is accurate to within ¼ of 1%, meeting the requirements of the National Bureau of Standards. Steel rules measure lengths in 32nds and 64ths on one side and in decimals in 10ths and 100ths on reverse side. A 1 in. capacity dial indicator measuring lengths and deflections to .001 in. is available. Adaptable for both general purpose and high quantity production testing, the speed of testing varies from 250 to 500 tests per hour. Production stops and tolerance markers are easily adjustable. Springs with diameters up to 2 in. and lengths up to 10 in. can be tested. Descriptive bulletin available from **The Carlson Co.**, 277 Broadway, New York 7, N. Y.

IF YOU REQUIRE

NO CMP REQUIRED

Submit your
SPECIFICATIONS
To The
REPRESENTATIVES:

J. GERBER & CO., INC.
855 Avenue of Americas
NEW YORK 1, N. Y.

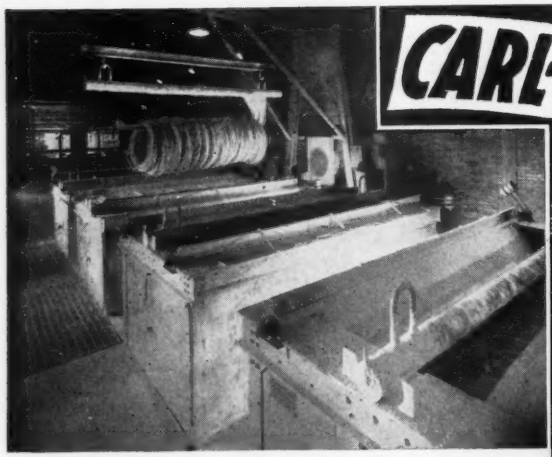
THE FACTS ON DRY DRAWING SOAPS FOR LOW CARBON STEEL WIRE

There are very specific requirements for a drawing soap to be used on low carbon steel wire. A completely anhydrous soap is essential, coarse granulated to allow maximum wire travel without tunnelling. The melting point of the soap must be high enough to resist the heat and pressure of the drawing operation. It should be water-soluble if subsequent removal by alkaline cleaning is necessary.

Magnus Dri-Draw No. 11 is compounded to meet these essential requirements. It is a granular, anhydrous soda base soap composition formulated for dry drawing of ferrous wire. It has great resistance to heat, and gives a bright, clean wire, produced at maximum drawing speed and at the lowest over-all production costs.

The cost of the drawing lubricant is by far one of the smallest of all production costs. Actually, it is merely the cost of the small amount of lubricant that is carried away by the drawn wire. The cost of a premium drawing lubricant can be more than justified by selecting one that materially reduces the over-all plant production costs.

The Magnus Chemical Company will be pleased to furnish you with any standard size container of drawing lubricant on a trial basis. Test it, considering all the factors which are of importance to the job. After this fair trial, if you do not feel that the Magnus Drawing Lubricant is more efficient than the competitive material in service, simply return the unused portion to us and we will cancel the invoice in full. It is understood that you are the sole judge . . . and there is no obligation. Magnus Chemical Company, 188 South Ave., Garwood, N. J. Adv



CARL-MAYER

HI-SPEED REGISTERED

ROD BAKERS

PATENT Nos.
U.S.A.
2,235,559
2,296,361
2,323,828
CANADA
396,144
401,589

ALSO OTHER TYPES OF INDUSTRIAL OVENS AND FURNACES

GREATER SPEED AND FUEL ECONOMY PROVES OUTSTANDING ENGINEERING

Carl-Mayer Hi-Speed Rod Bakers have an exclusive heating arrangement, combining faster baking with amazing fuel economy — and a patented Blow-Off feature which removes moisture without bumping or agitating the coils. *WRITE FOR BULLETIN NO. 350.*

SERVING CONCERNS LIKE THESE:

American Steel & Wire Co.
Atlantic Wire Co.
Atlas Steel Co.
Atlas Tack Corp.
Babcock & Wilcox
Canadian Steel Corporation.
California Wire Cloth Corp.
Colorado Fuel & Iron Corp.
Crucible Steel Co. of America.
Eaton Manufacturing Co.
Frost Steel & Wire Co., Ltd.
B. Greening Wire Co., Ltd.
Gary Screw & Bolt Division of Pittsburgh Screw & Bolt Corp.
Hollup Corp.
Indiana Steel & Wire Co.
Johnson & Nephew, Ltd.
Jones & Laughlin Steel Corp.
Page Steel & Wire Co.
Pittsburgh Tool Steel Wire Co.
Republic Steel Corp.
Steel Co. of Canada

THE CARL-MAYER CORPORATION

3030 EUCLID AVENUE
CLEVELAND, OHIO

VINYLS for . . .

CRITICAL CUSTOMERS

For the past ten years we have specialized in the compounding of Vinyl extrusion and injection molding compounds to specifications, or developing compounds for a specific end use.

Underwriters' approved standard compounds are available in all colors for POT, T, TW, 80 Degree C, 90 Degree C and 105 Degree C wires.

Save your plant space for wire processing equipment. Let us tailor your compounds to bring out the special properties you require.

Your inquiries are invited.

ELECTRONIC RUBBER COMPANY

69 Sunnyside Ave. • Stamford, Conn.

Personalities

(*Continued from page* 1209)

MacWhyte Company Announces New Directors And Officers

At a meeting of the board of directors of **Macwhyte Company** (manufacturers of wire rope), the following were elected directors: **E. C. Berg, G. Johnston** and **M. A. Buntrock.**

★ ★ ★

E. C. Berg was appointed Vice President and Controller.

G. Johnston was appointed Treasurer and Assistant Secretary.

M. A. Buntrock has been Secretary and Assistant Treasurer and continues in that capacity.

★ ★ ★

Other directors and officers of the company are as follows:

George C. Wilder, President, **R. B. Whyte,** V. P. Charge Operations, **Robert P. Tyler,** V. P. Charge Sales, **H. E. Sawyer, Richard P. Cavanagh,** and **James T. Wilson.**

★ ★ ★

Keystone Elects Officers And Directors

Following a reorganization meeting of the board of directors of the **Keystone Steel & Wire Company** on October 1st, R. E. Sommer, president and general manager, announced the election of **W. B. Sommer, Paul W. Sommer,** and **Walter V. McAdoo, Jr.** to the executive committee. **R. E. Sommer,** president and general manager, and **D. P. Sommer,** executive vice president, were reelected to the executive committee on which they have served since 1935.

★ ★ ★

At the same time, Mr. Sommer announced the elevation of **A. H. Sommer** to vice president and general superintendent.

★ ★ ★

The three men named to the executive committee have been members of the board of directors for the past year. W. B. Sommer is a vice president of the parent company, as well as an officer and director of National Lock Co., Rockford; Mid-States Steel & Wire Company, Crawfordsville, Indiana; and Wire Specialties Company, Santa Clara, California.

★ ★ ★

Paul W. Sommer, vice president and treasurer, is also a director of National Lock Co., Mid-States Steel & Wire Company and Wire Specialties Company, Keystone subsidiaries.

★ ★ ★

Walter V. McAdoo, Jr. has been secretary of the executive committee since July 14, 1944, and vice president since October 16, 1945. He is also a director of Keystone's three subsidiary companies, National Lock Co., Mid-States Steel & Wire Company, and Wire Specialties Company.

★ ★ ★

Keystone's new vice president and general superintendent has been superintendent of steel mills since 1935. A member of the 25-Year Club, he has been a director of the company since 1942.

★ ★ ★

A. H. Sommer was first employed by Keystone in 1917 during summer vacation from Bradley. He was graduated in 1921. In 1926 he joined Keystone as a bundler of scrap rods. Temporary assignments in other departments followed until he was appointed "trouble shooter" reporting directly to the general plant superintendent. Here he planned machine improvements, redesigned production equipment, increased plant efficiency. Following a few years as superintendent of the post mill, he was promoted to superintendent of steel mills in 1935. He has been an executive board member since 1944.

★ ★ ★

Other officers renamed by Keystone's directors in this meeting were **G. W. Racine,** secretary and assistant treasurer, **Edw. W. Roth,** assistant treasurer, **A. L. Ackerman,** assistant secretary, **John Hinnen,** controller, and **S. M. Vermeil,** assistant controller.

★ ★ ★

Connecticut Wire Mill Announces Appointments

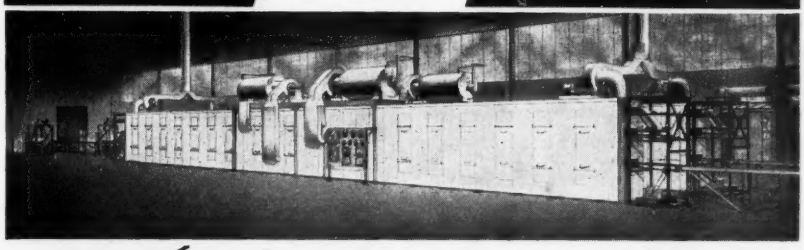
John H. Mulliken, Vice President and General Manager of **The Gilbert and Bennett Manufacturing Company,** Georgetown, Connecticut, has announced the following appointments, effective October 1, 1952.

★ ★ ★

William D. Bawden has been made

CARL-MAYER WELDING ROD OVENS

PATENT NOS. 1,843,430 2,373,325



One of Several Carl-Mayer Ovens at Hollup Corp.

FAST, EFFICIENT AND ECONOMICAL DRYING OF COATED WELDING RODS.

Only in Carl-Mayer Ovens can you obtain the combination of the recirculating gas fired air heater principle and the "Mayer" patented rod transfer system — two highly important features in ovens of this type.

We also build other types of industrial ovens and furnaces. Carl-Mayer installations are backed by reputation for unusual performance, and over 30 years' experience.

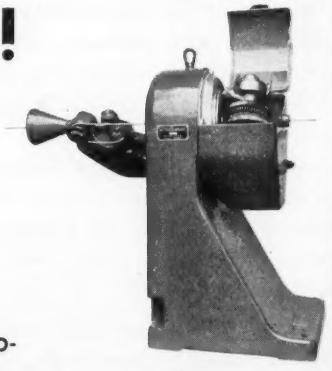
WRITE FOR BULLETIN NO. 350

THE CARL-MAYER CORPORATION

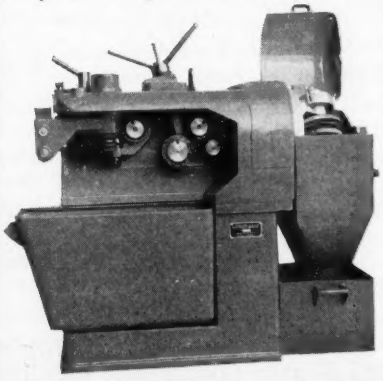
3030 EUCLID AVENUE
CLEVELAND, OHIO

TRY—one or both!

LINÉ-GORCY MECHANICAL WIRE ROD DESCALERS



YOU can TEST these remarkable two-stage descalers in YOUR MILL at practically NO COST!—BECAUSE they do PAY for themselves in the dry descaling of the first FEW hundred tons of YOUR RODS!



FISHER ASSOCIATES

SOLE AMERICAN DISTRIBUTORS

Suite 1119—Chanin Building
122 East 42nd Street
New York 17, N. Y.

Telephone: MUrray Hill 5-1937

THE FACTS ON DRAWING COMPOUNDS FOR FINE COPPER and BRASS WIRE

High soap and low fat concentration characterize the best composition of drawing compounds for fine sizes of copper and brass wire. The softer potassium soaps are recognized as giving particularly satisfactory results. The fatty acid content in these compounds must be kept as low as possible to avoid the formation of an abrasive green copper soap scum as a result of reaction between copper and the acid.

Magnus No. 71, a soap paste composition used in dilute water solution (one to three pounds per twenty-five gallons), has been formulated to meet the above exacting conditions and assures consistently superior results on fine copper and brass wire drawing.

The cost of the drawing lubricant is by far one of the smallest of all production costs. Actually, it is merely the cost of the small amount of lubricant that is carried away by the drawn wire. The cost of a premium drawing lubricant can be more than justified by selecting one that materially reduces the over-all plant production costs.

The Magnus Chemical Company will be pleased to furnish you with any standard size container of drawing lubricant on a trial basis. Test it, considering all the factors which are of importance to the job. After this fair trial, if you do not feel that the Magnus Drawing Lubricant is more efficient than the competitive material in service, simply return the unused portion to us and we will cancel the invoice in full. It is understood that you are the sole judge . . . and there is no obligation. Magnus Chemical Company, 188 South Ave., Garwood, N. J. Adv.

Works Manager, **Fred Leuders** is now Assistant Superintendent, **Harry Lindstrom** has been appointed Chief Engineer and **Peter Harco** has been named Master Mechanic.

★ ★ ★

The company, now over a hundred years old, is well known as manufacturers of various types of screen cloth, woven and welded wire fencing, poultry wire, etc., and operates a large wire drawing department, in which wire is produced for their own fabricating needs.

★ ★ ★

Appointed Sales Representative By Flexible Tubing Corporation

The Flexible Tubing Corporation of Guilford, Connecticut, announces the appointment of **Reed A. Weyburn** as Representative-Distributor Sales. He will assist **A. H. Loux,** Manager-Distributor Sales, in work with Flexible Tubing's rapidly expanding network of fully-stocked distributors across the country.

★ ★ ★

Prior to joining Flexible Tubing, Mr. Weyburn was with the Connecticut Light & Power Company for seven years, and was with The Stanley Works as a sales engineer in charge of the Pacific Northwest for the Steel Strapping Division.

★ ★ ★

Mr. Weyburn is a graduate of Yale University, and served with the Navy in World War II in both the Atlantic and Pacific theaters.

★ ★ ★

J & J Appoints Brady To Fill New Job

T. H. Brady has been appointed to newly-created position of assistant manager of sales, Cold Finished Products, **Jones & Laughlin Steel Corp.,** Pittsburgh.

★ ★ ★

Michigan Oven Appoints Eastern Representative

Michigan Oven Company, Detroit 2, Michigan, has announced the appointment of **A. N. Mason** and **John Kenneth Gillett** as its sales representative in Metropolitan New York, including northern New Jersey. Mr. Mason and Mr. Gillett will also represent **Eclipse Fuel and Engineering Company.**

★ ★ ★

Mr. Gillett, educated at Carnegie and Kenyon College with a degree

Here's a Good Tip For Better Lubricating Film . . . Use

BORAX

• More and more, smart wire mills are switching to a BORAX solution for coating wirestock surfaces before drawing. They choose BORAX because the residual film it produces stays tight, yet pliable, and is an excellent vehicle for the drawing lubricant. A BORAX solution coats steel wire with just ONE DIP . . . film dries quickly in just a few minutes.

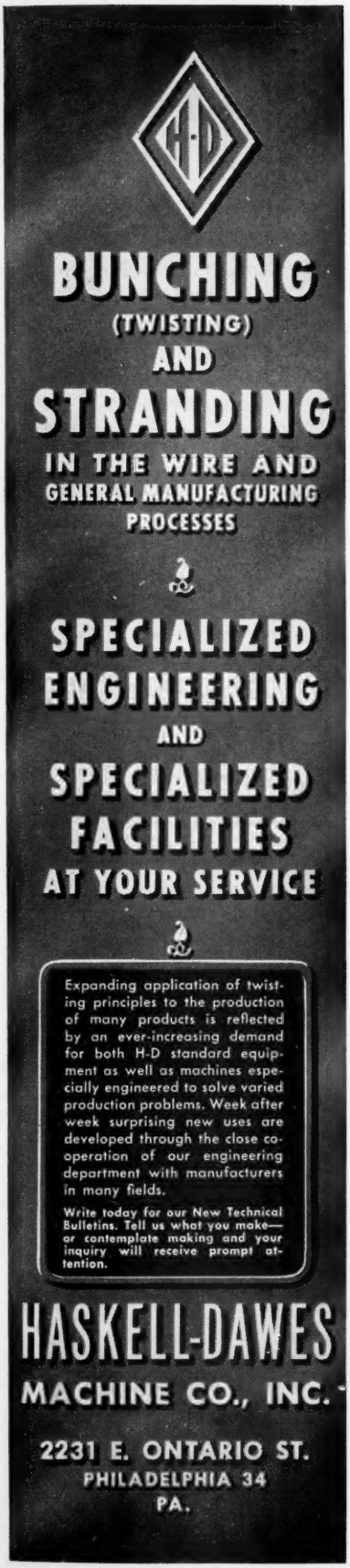
Here Are The Advantages of Borax-Coated Stock:

- **Compatible with drawing lubricant.**
- **Cleaner to handle in transit.**
- **Remains in better condition . . .** *an adequate supply can be stored for weeks without reconditioning.*
- **No cleaning of ends necessary before electric butt welding.**
- **Rust inhibited . . . no oxide film forms.**
- **Can be cleaned most easily.**

WRITE FOR FULL INFORMATION

PACIFIC COAST BORAX CO.
DIVISION OF BORAX CONSOLIDATED, LIMITED
NEW YORK • CHICAGO
LOS ANGELES • CLEVELAND
PHILADELPHIA

MANUFACTURERS OF FAMOUS 20 MULE TEAM PACKAGE PRODUCTS


BUNCHING
(TWISTING)
AND
STRANDING
IN THE WIRE AND
GENERAL MANUFACTURING
PROCESSES
SPECIALIZED
ENGINEERING
AND
SPECIALIZED
FACILITIES
AT YOUR SERVICE
Expanding application of twisting principles to the production of many products is reflected by an ever-increasing demand for both H-D standard equipment as well as machines especially engineered to solve varied production problems. Week after week surprising new uses are developed through the close cooperation of our engineering department with manufacturers in many fields.
Write today for our New Technical Bulletins. Tell us what you make—or contemplate making and your inquiry will receive prompt attention.
HASKELL-DAWES
MACHINE CO., INC.
2231 E. ONTARIO ST.
PHILADELPHIA 34
PA.

in physics, has been engaged for a number of years in sales work and engineering involving combustion systems, material handling and ovens for such firms as Ferro Enamel Corporation, Atlas Car and Manufacturing Company, and for four years with Industrial Ovens, Inc., Cleveland, Ohio, of which he was vice president and sales manager.

★ ★ ★

Mr. Mason, a graduate of the Drexel Institute of Technology, has served as an industrial sales engineer representing the Philadelphia Gas Works Company, Gehnrich and Gehnrich, Inc., American Gas Furnace Company and Partlow Corporation. More recently, he has been the New York sales representative of Industrial Ovens, Inc., Cleveland, Ohio and Eclipse Fuel and Engineering Company.

To Represent Firth Sterling in West Virginia

Firth Sterling, Inc., Mining Division, has appointed **E. E. McAllister** as salesman, to represent them in the Princeton, W. Va., territory. Mr. McAllister has had eighteen years experience in the coal mining business. Before coming to Firth Sterling, he was employed by the Peabody Coal Corp., as foreman, and by the Old Ben Coal Corp., also as foreman. Mr. McAllister was a mine inspector for the U. S. Bureau of Mines for two years. He is presently a member of the West Virginia Mining Institute.

W. O. Springer to Manage Ryerson's New York Plant

William O. Springer has been appointed manager of the New York plant of **Joseph T. Ryerson & Son, Inc.,** steel distributors, it was announced by C. L. Hardy, president. He formerly managed the Company's Cleveland plant.

★ ★ ★

Mr. Springer, a graduate of Purdue University, came to Ryerson in 1929 from Babcock & Wilcox Company. Starting in a sales capacity at Chicago he subsequently moved to Cleveland to head the alloy and stainless steel department. He was named plant manager at Cleveland in 1945.

★ ★ ★

ADVERTISE

in the 1953 Edition of the WIRE AND WIRE PRODUCTS BUYERS' GUIDE

The cost is low — the advantages great.

Your ads under or near your listings, will help buyers to determine whether your products are what they want, *when they are in the market to buy.*

ADVERTISING RATES

1 page	$90.00
½ page	60.00
¼ page	35.00
1 inch	10.00
3 1-inch cards	25.00
5 or more 1-inch cards, each	7.50

Other rates upon request.

Type page size: 5"x8"
Column width: 2⅜"

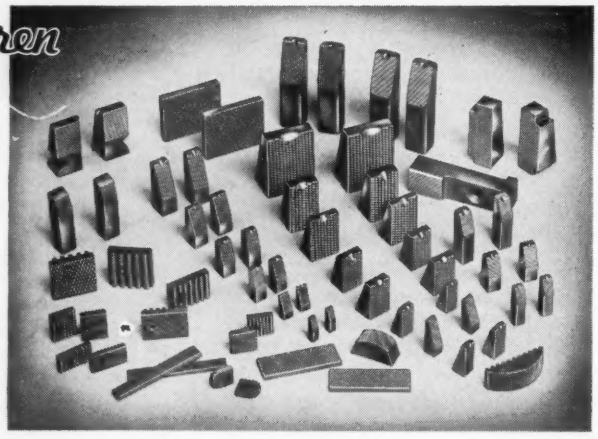
Place your order today for advertising in the 1953 BUYERS' GUIDE, *the only directory published for the wire industry.*

Forms close Jan. 25, 1953

WIRE AND WIRE PRODUCTS
453 MAIN ST.
STAMFORD, CONN.

Sjogren

JAWS.... for Wedge Grips, Pullers and Tensile Testing Machines of all makes are available either from stock or manufactured to order. A Sjogren jaw, made to meet your requirements, guarantees you service.



Our Silver 25 1927-1952 Anniversary Year

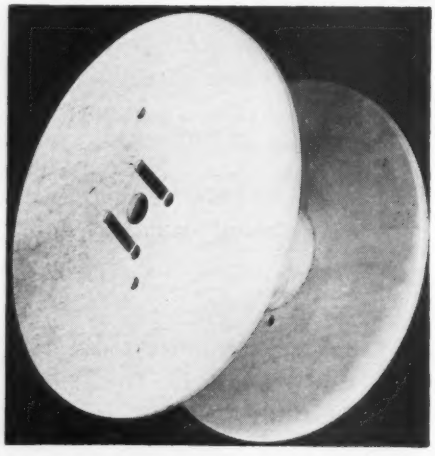
SJOGREN TOOL AND MACHINE CO., INC.

WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

14 SWORD STREET
AUBURN
MASSACHUSETTS

Represented in Canada by THE LARSON CO., 98 Wellington St., West, Toronto, Ont.

FINE PLYWOOD REELS
FOR WIRE



Made of air-dried wood, all parts secured with metal strapping. This reel is durable and strong. Heads cannot be dislodged by heavy side load pressures.

Reels shipped knocked down or assembled — metal strapping easily applied by standard metal fastening clips used for boxes, etc.

Heads have accurately fitted dovetail joints that give the reel extreme rigidity. Returnable and non-returnable types, made in head diameters of 6 in. to 22 in.

Shipped to any point in New England by truck.

Get the facts on these fine reels

WINCHESTER REEL COMPANY, Inc.
ASHUELOT, N. H. TEL.: WINCHESTER 163-2

Our Products Carry Reel Loads.

James M. Mead, whom Mr. Springer replaces at New York, is moving to the executive offices at Chicago for administrative duties. **John W. Queen,** formerly alloy steel division manager at Chicago, has succeeded Mr. Springer at Cleveland.

S. W. Hallway Promoted by Waterbury Farrel Foundry & Machine Co.

The Waterbury Farrel Foundry & Machine Company through its president Richard L. Wilcox, has announced the appointment of a new general superintendent, **Stephen W. Hallway.** He will fill the vacancy created by the death of William J. Secor, Sr. on September 11th. Mr. Secor had held the general superintendent position since 1926.

★ ★ ★

Mr. Hallway has been associated with the company since 1915 and has been serving as production superintendent. No successor has been named to his former position.

Promotions Announced at Allegheny Ludlum's Dunkirk Plant

Four promotions at the Dunkirk plant of **Allegheny-Ludlum Steel Corporation** have been announced by Walter R. Breeler, general plant manager. The advancements are the result of the recent promotion of **Robert Pfisterer** to the position of assistant plant manager following the death of Chester G. Cottrell.

★ ★ ★

Succeeding Mr. Pfisterer as department manager of the Lucas Avenue fine wire mill is **Charles W. Parker.**

★ ★ ★

Mr. Parker is being succeeded as assistant department manager by **Adelbert J. Tofil.** Mr. Parker was made superintendent of the fine wire mill April 15th of this year.

★ ★ ★

Replacing him as superintendent is **Joseph J. Opacinch.** He has been assistant superintendent.

★ ★ ★

Also named a superintendent was **John P. Kubasik,** who has been assistant superintendent.

★ ★ ★

DO YOU HAVE ANY OF THESE PROBLEMS IN WET WIRE DRAWING?

Do you get acid contamination on your wire? Your drawing compound should contain a "neutralizer" to counteract the soap breaking effect of acid.

You'll find that Magnus No. 41, a granular, anhydrous powder used in dilute water solution (one to three pounds per twenty-five gallons), is an excellent answer to this problem. It has been formulated specifically to meet it.

Do you have to contend with excessive foaming? Your drawing compounds should be formulated with materials capable of providing adequate lubrication under extreme pressure conditions, with a minimum of foaming.

Magnus Heavy Duty Soluble Oils, DO-1A and DO-4A, contain oiliness and extreme pressure materials, and form emulsions that do not foam—yet give perfect drawing lubrication.

The cost of the drawing lubricant is by far one of the smallest of all production costs. Actually, it is merely the cost of the small amount of lubricant that is carried away by the drawn wire. The cost of a premium drawing lubricant can be more than justified by selecting one that materially reduces the over-all plant production costs.

The Magnus Chemical Company will be pleased to furnish you with any standard size container of drawing lubricant on a trial basis. Test it, considering all the factors which are of importance to the job. After this fair trial, if you do not feel that the Magnus Drawing Lubricant is more efficient than the competitive material in service, simply return the unused portion to us and we will cancel the invoice in full. It is understood that you are the sole judge . . . and there is no obligation. Magnus Chemical Company, 188 South Ave., Garwood, N. J. Adv.

Hooker Adds to Technical Staff

Hooker Electrochemical Company has recently employed the following technical people:

Donald J. Stone has been hired as a mechanical engineer. He is a graduate of Purdue University and had previously been employed as a test engineer at Bell Aircraft and as an instrumentation engineer by Union Carbide and Carbon Corporation.

★ ★ ★

Edward A. Hutton, a graduate of Clarkson College of Technology has been employed as a chemical engineer in the process study group.

★ ★ ★

Robert H. Pugh, a graduate chemist from Ohio Northern University, has been hired as a chemist in the works laboratory. He has had previous experience in chemical work with National Carbon Company, the duPont Company, United States Rubber Reserve and Harshaw Chemical Company. Mr. Pugh served in the Navy for two and one-half years and was recalled for active duty for 22 months prior to his coming to Hooker.

AS&W Advances Two Men

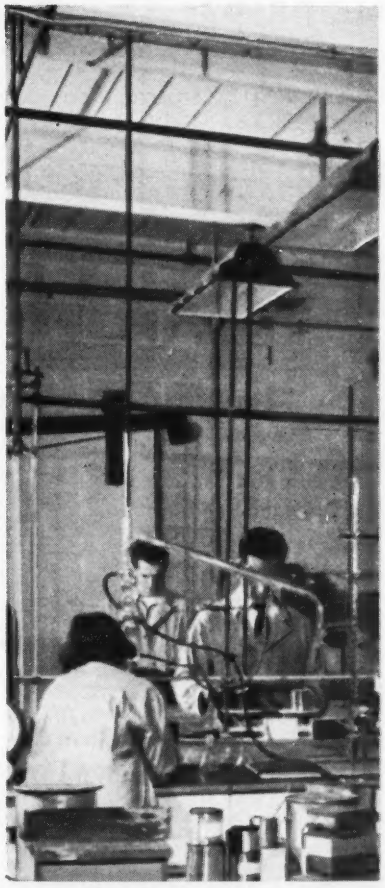
Edward C. Speter has been appointed assistant director of industrial relations in charge of labor relations for **American Steel & Wire**, it has been announced by Francis J. Burtt, director of industrial relations for this United States Steel Division. He succeeds **Axel H. Olson**, who has been named assistant director of industrial relations on special assignments.

Belden Manufacturing Company Holds 50th Anniversary Open House

Belden Manufacturing Company recently held open house in its Chicago, Illinois and Richmond, Indiana plants for families and friends of its employees, to celebrate its 50th Anniversary. Over 11,000 attended the celebrations which were held in the two plants. Flowers and favors were provided.

★ ★ ★

Belden Manufacturing Company was formed by **Joseph C. Belden**, and incorporated September 25,



RESEARCH FOR YOU—AT OUR EXPENSE!

Your cable coating problems can only be solved by adequate laboratory research.

Realizing this fact, we regularly allocate six cents out of every sales dollar for lacquer research activities. This progressive research policy enables us to formulate modern, improved coatings designed to meet the newest of present-day specifications.

Are you currently faced with a cable coating problem? If so, we'd appreciate the opportunity to help. Write today!

The above photograph is one of many contained in an eight-page brochure describing our facilities to serve you. Write for your copy of the complete brochure!

NORBIDE® Abrasive: *Effective, Economical*

NORBIDE Abrasive, made of Norton Boron Carbide, is second only to the diamond in hardness — *but 150 times less expensive!* It will effectively cut and semi-finish wire drawing dies, particularly those made of the hard cemented carbides.

Write for Catalog No. 559-W

NORTON COMPANY
Worcester 6, Mass.

NORTON *Making better products to make other products better*

DIAMOND DIES
Master-Made by PHILIPS

Of all the diamonds mined, less than .4% meet PHILIPS' high quality requirements such as purity, structure, and shape.

Master craftsmen transform them into dies in the world's largest, most modern diamond die factory. Drilled to precision tolerances, these are available to American industry under the NORELCO trade name.

NORTH AMERICAN PHILIPS CO., INC.
100 E. 42nd ST., NEW YORK 17, N. Y.

Product of MODERN SCIENCE and MASTER CRAFTSMANSHIP

1902. Besides Mr. Belden, there were 14 stockholders, and the total capital was $50,000. The company has grown steadily. Today its 1,900 shareholders hold 320,614 shares of stock, and the last year's sales totaled $24,347,000.

★ ★ ★

Charles S. Craigmile, President, in commenting on this "family" party, stressed the fact that great numbers of the 1,500 present employees had spent many years with the company. Mr. Craigmile himself joined Belden 38 years ago.

★ ★ ★

Hickernell of Anaconda Heads AIEE Program Committee

L. F. Hickernell, chief engineer at **Anaconda Wire & Cable Co.,** Hastings-on-Hudson, N. Y., has been appointed chairman of the Technical Program Committee for the 1953 Winter General Meeting of the American Institute of Electrical Engineers. The meeting, which will be held Jan. 19-23 in the Hotel Statler, New York, will be attended by more than 4,000 of the nation's leading engineers, scientists and research men and women.

★ ★ ★

Mr. Hickernell and his Committee will supervise sixteen daily technical sessions. They will be held simultaneously and, during the five day period, will cover every field of electrical engineering and related sciences.

★ ★ ★

New Book on Surface-Active Agents

Encyclopedia of surface-active agents, by J. P. Sisley and P. J. Wood, a 540-page book, has just been published by the Chemical Publishing Co., Inc., 212 Fifth Ave., New York. It sells for $15.00.

★ ★ ★

Part I deals with the general aspects of surface-active agents, their properties, applications, and methods of manufacture. It also gives a most efficient system of classification by which every variety of the modern surface-active agents can be identified by simple symbols.

★ ★ ★

THE FACTS ON ALKALINE COATING COMPOUNDS vs LIME

The use of alkaline type coating compounds is rapidly becoming standard practice—replacing the use of lime.

There are excellent technical reasons for this trend. The alkaline type of coating provides superior rust protection. It eliminates time-wasting baking operations. It insures much longer die life and gives a better finish to the wire. Above all, the drawing operation is cleaner, as the alkaline coating does not flake off the wire.

Magnus Metalcoat No. 267 pioneered the alkaline type of coating. It will readily prove its superiority if you give it a trial. The Magnus Chemical Company will be pleased to furnish you with a standard size container of Magnus No. 267. Test it, considering all the factors which are of importance to the job. After this fair trial, if you do not feel that Magnus No. 267 is more efficient than the material you are now using, simply return the unused portion to us and we will cancel the invoice in full. It is understood that you are the sole judge and there is no obligation.

Magnus Chemical Company, 188 South Ave., Garwood, N. J.

Adv.

Among the chemicals covered are wetting agents, detergents, penetrants, foaming compounds, emulsifiers, and dispersing agents. It describes their many applications in the textile industry; leather industry; as industrial and household detergents; in the treatment of metals; in surface coatings; in paper manufacture, as flotation reagents; for the breaking of emulsions; in fat splitting; in soap making; in the rubber industry; in the fruit and vegetable processing; in cosmetics; in inks; in cutting and soluble oils.

★ ★ ★

Part II is an alphabetical listing of brand-name surface-active agents manufactured all over the world. For most of the items the following information is listed; brand name; manufacturer; identical or similar products; chemical composition; class; appearance; properties; reaction; references; patents; applications; quantities used in different applications.

Thurman to Manage New Division for Aetna-Standard

The Aetna-Standard Engineering Company, Pittsburgh, Pa., announces the appointment of **A. L. Thurman** as Manager of the Plastics and Rubber Machinery Division. Mr. Thurman has been Assistant to the Vice-President with offices in Ellwood City, Pa. He will direct the activities of his new position from the Warren, Ohio, plant. He has been with Aetna-Standard since 1945 and was formerly a steel mill application engineer for General Electric. He holds degrees in both mechanical and electrical engineering from Oklahoma A & M.

★ ★ ★

Aetna-Standard specializes in the manufacture of wire drawing machines, seamless tube mills, continuous butt weld pipe mills and other equipment for the ferrous and non-ferrous industries. They entered the rubber and plastics machinery business approximately two years ago when they appointed Hale & Kullgren, Inc., of Akron, Ohio, as their engineers and sales representatives in that field. Earlier this year, they augmented their business by purchasing the rubber and plastics machinery division of the National Erie Corp., Erie, Pa.

The Reason is Simple . . .

Mason spools save you money because they cost less — yet satisfy your most rigid requirements for non-returnable use!

Each Mason spool is manufactured by modern mass-production methods that assure sturdy construction at minimum cost. Lithographing operations are efficiently performed in Mason's own plant to maintain exact quality control.

Find out more about how Mason can reduce your spool costs. Mason spools are available in all standard head and barrel sizes. Write today for more information.

MASON CAN COMPANY
1949 Dexter Rd., East Providence 14, R. I.
MASON CAN COMPANY OF OHIO
Greenville, Ohio

THE FACTS ON DRAWING COMPOUNDS FOR ALL TYPES OF WIRE

The speed of wire drawing operations today is tremendously in excess of what it used to be. Better finishes are demanded than in the past. The drawing compound used for any modern drawing operation must be far more carefully tailored to the kind of drawing operation and the type of wire involved than ever before.

The cost of the drawing lubricant is by far one of the smallest of all production costs. Actually, it is merely the cost of the small amount of lubricant that is carried away by the drawn wire. The cost of a premium drawing lubricant can be more than justified by selecting one that materially reduces the over-all plant production costs.

Whether you carry on wet or dry drawing operations . . . on copper or brass, low or high carbon steel or stainless steel . . . you can get the specially designed drawing compound that will do the best possible job on your type of wire and at the lowest possible over-all cost from Magnus.

The Magnus Chemical Company will be pleased to furnish you with any standard size container of drawing lubricant on a trial basis. Test it, considering all the factors which are of importance to the job. After this fair trial, if you do not feel that the Magnus Drawing Lubricant is more efficient than the competitive material in service, simply return the unused portion to us and we will cancel the invoice in full. It is understood that you are the sole judge . . . and there is no obligation. Magnus Chemical Company, 188 South Ave., Garwood, N. J. Adv.

Entwistle Men Hold New England Clambake

On Saturday, September 13, 1952, **The James L. Entwistle Co.** held their first annual outing. Employees, their families and friends, guests of the Company and outstanding men of the Wire Industry attended.

★ ★ ★

With clam cakes and chowder served for the noon meal, everyone started the sporting events greatly invigorated. Baseball, horseshoe pitching, three-legged races and other contests were the events of the warm and sunny afternoon.

★ ★ ★

In the late afternoon the true New England Clambake was started by the bake master with the heating of the rocks, which took about two hours. Approximately 100 rocks were heated in an oak wood fire and then placed into a pit within the ground. This pit measured 9 feet in diameter and approximately one foot in depth. The rocks were then covered with about 4″ of fresh wet seaweed.

★ ★ ★

The food was then placed in alternate layers with more seaweed. The bill of fare was as follows: sweet potato, white potato, fish, clams, sausage, whole ears of corn and lobsters. The foods that required the longer cooking were placed on the bottom where the heat was more intense. The entire bake was covered with a wet tarpaulin, the edges of which were covered with dirt. During the three hours the food took to bake, the canvas was wet continually.

★ ★ ★

A chicken dinner was served as an alternate for those who did not like sea food.

★ ★ ★

Watermelon and coffee was served after the main course and judging from the satisfied air of everyone present, the first annual bake was an outstanding success.

★ ★ ★

There were many door prizes given, as well as a souvenir key chain for each person attending the outing.

Mirra Lap Folder

J. K. Smit & Sons, Inc., Murray Hill, N. J., manufacturers of Industrial Diamond Products announce

M & T STANNOUS SULFATE

Saves Tin!

in liquor finishing operations

because

M & T Stannous Sulfate — a manufactured chemical — saves tin by doing away with many of the inefficiencies which accompany the treating of feather or flake tin to produce stannous sulfate on the job.

More convenient to use, too!

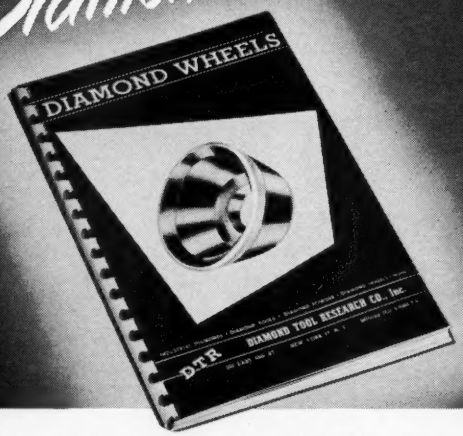
Baths are operable as soon as materials are dissolved. Solutions can be prepared in advance to produce desired colors and coating thicknesses.

AND, **additions are made from stock solutions, assuring quick, complete mixing—eliminating any possibility of materials only partially dissolving in the bath—reducing the chances of miscalculating quantities of materials added.**

Use M & T Stannous Sulfate for white or straw-color finishes. Write for technical procedure sheet.

METAL & THERMIT CORPORATION
Chemical Division
100 E. 42nd St., New York 17, N. Y.
Specialists in Tin and Tin Chemicals

NEW CATALOG OF
Diamond Wheels



DTR resinoid bonded diamond wheels are making headlines for quality, delivery and price. Our completely new 32 page catalog tells the whole story. Write for your copy today!

DTR DIAMOND TOOL RESEARCH CO., Inc.
305 East 45th Street • New York 17, N. Y.
MUrray Hill 4—0466-7-8

OVER 150 Years OF COMBINED OVEN ENGINEERING EXPERIENCE

ANNEALING AND ENAMELING
. . . OVENS . . .
DESIGNED TO FIT THE JOB

•

WHEN you have an annealing or enameling problem, take advantage of our engineering staff's long and specialized experience in the designing of ovens for leaders in industry throughout the nation. If you will tell us your requirements, we shall be pleased to give you our recommendation.

Write for Brochure:
"Your Oven Problems"

MICHIGAN OVEN COMPANY MOCO
DETROIT MICHIGAN

Representatives In Principal Industrial Areas

MICHIGAN OVEN COMPANY
425 Brainard Street, Detroit 1, Mich.

the release of a new seven-color brochure dealing with the Company's Diamond Lapping Compound, "Mirra-Lap".

★ ★ ★

The brochure is geared to answer all questions pertaining to the applications, advantages and cost of this product. Photographs show clearly how and where to use Mirra Lap. For further clarification a table is included showing the variety of grades, in their actual color, prices, and individual uses for each grade. Illustrations of applicators and tubes are also included. For a copy write to J. K. Smit & Sons, Inc., Murray Hill, N. J.

New Gauge Measures Tensions

A brand new addition to the popular line of Dillon Mechanical Pressure Gauges—a model that is designed to measure the amount of tension in a moving or stationary cable, plastic filament, yarn, paper, twine, etc. Readings are taken directly in pounds by means of a jewelled dial indicator.

★ ★ ★

In operation, the object to be measured passes over a ball-bearing sheave or roller. This sheave is mounted in a yoke which is screwed to the "U" shaped pressure bar of the instrument. The bar itself is of heat treated alloy steel. Under downward pressure of the moving filament, it deflects only .039″ for a full scale reading. Accuracy is guaranteed to within 1% of the indicated reading.

★ ★ ★

Common conception of pressure gauges is that they all operate by means of steam, oil, air or gas pressure only. The Dillon instrument is a distinct departure from this being 100% mechanical and designed to measure mechanical forces existing between air vise jaws, clamps, hydraulic platens, rollers, spot welder electrodes, etc. The largest model measures only 4¾″ x 2⅛″ x 3⅛″ and fits into "tight" spots with ease.

★ ★ ★

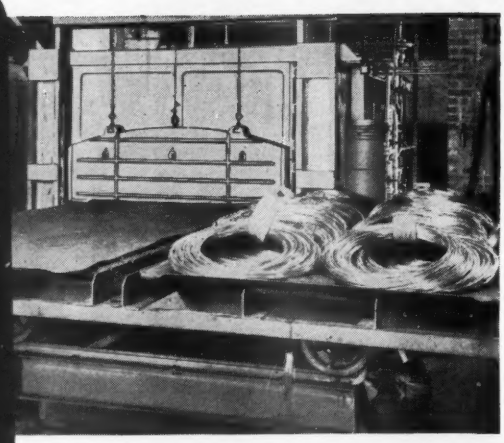
A threaded mounting hole is provided in the bottom half of the "U" shaped pressure bar so that it can be mounted in special fixtures. Reasonable overloads do not harm calibration, and a maximum pointer is available optionally. We can provide this unit in 10, 25, 50, 100, 250,

ROCKWELL FURNACES

for Annealing Hardening · Drawing · Normalizing Galvanizing and Tinning

Batch or Continuous · Oil, Gas or Electric

Direct Heated Muffle Type Radiant Tube Atmospheres



Gas-fired pan type furnace for annealing 5000 lbs. of medium gauge brass wire; furnace atmosphere controlled to produce oxide-free wire — in many cases practically bright. Other Rockwell furnace types include parallel tube, belt conveyor, pit, hood and others.

ROCKWELL SINCE 1888 BUILT

FURNACES · OVENS · SPECIAL MACHINERY

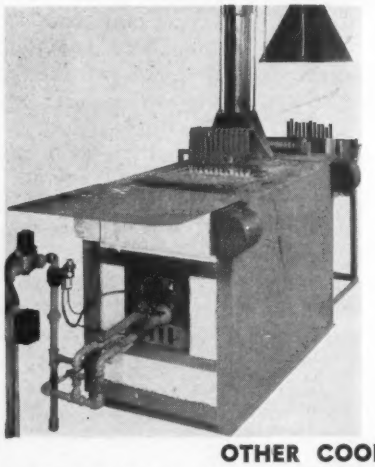
W. S. ROCKWELL COMPANY

242 ELIOT STREET · FAIRFIELD, CONN.

In Canada: Francis Hankin & Co., Ltd. Montreal & Toronto

12-Head High Speed Tinner

PAY-OFF • FLUX POT • TIN POT • TAKE-UP



HOT TINNING SPEEDS UP TO 900 FT. PER MIN.

HANDLES WIRE FROM B. & S. No. 24 THRU B. & S. No. 36

Efficient • Dependable

OTHER COOK EQUIPMENT

- Wire Drawing machines
- Bunchers
- Twisters
- Wire String-Up machines
- Enameling Take-Ups and Pay-Offs
- Enameling machines
- Cabling machines
- Spoolers
- Tinning Take-Ups and Pay-Offs
- Tinning Pots
- Wrapping machines
- Special machinery

COOK MANUFACTURING COMPANY

265 NORTH 9TH STREET PATERSON 2, N. J.

500, 1000, 2500 or 5000 pound capacities. Shockless versions are also offered.

★ ★ ★

For information, write to **W. C. Dillon & Co., Inc.**, 14620 Keswick St., Van Nuys, Cal.

Fastener Concern Expanding Plant

H. M. Harper Co., Morton Grove, Ill., manufacturer of nonferrous bolts and nuts, is constructing another addition to its plant. It will house the firm's newly developed Aero Division, specializing in the manufacture of high-temperature fastenings used in the jet engine industry.

New Folder on Dies

A folder entitled "You'll Want to See" has been issued by the **Carboloy Department** of **General Electric Company**, 11115 E. 8 Mile Blvd., Detroit 32, Mich.

★ ★ ★

The theme is why maximum tonnage can be secured by using Carboloy wire drawing dies. Carboloy's various services to wire mills are also described.

★ ★ ★

For a copy of this folder, please write to Carboloy at the address above.

"I'LL HAVE TO TELL THAT GUY ABOUT MAGNUS HAND CLEANER"

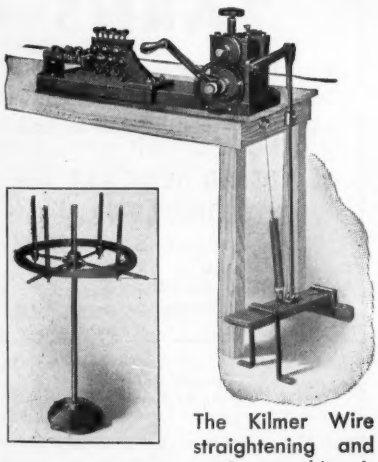
Angier

Complete Spiral Wrapping Service

- Creped to s-t-r-e-t-c-h wraps to protect against rust, moisture, oil, or abrasion.
- Proven vapor method that stops rust without slushing . . . Angier VPI ® Wrap.
- Machines, devices for spiral wrapping.
- Installation and service at no charge.

FREE — Spiral Wrap Booklet — FREE
Angier Corporation, Framingham 3, Mass.

WIRE STRAIGHTENER



The Kilmer Wire straightening and cutting machine is hand operated and recommended for wire No. 8 to No. 19 gauge.
Wire Reel will handle coils up to 150 lbs. with I.D. adjustments from 7" to 22" and 30" O.D.

M. D. KILMER & COMPANY
4840 BROOKPARK RD.
CLEVELAND 9, OHIO

Baker Offers New Fork Truck

Development of a new 2500-pound capacity electric fork truck that travels at speeds up to 7 miles per hour and makes a U-turn in an 8½-ft. aisle has been announced by **The Baker-Raulang Company,** 1230 W. 80th St., Cleveland 2, Ohio.

★ ★ ★

Called the FS-25, and designed to speed the handling of materials in manufacturing plants and warehouses, the new truck is rated for loads up to 2500 pounds (48 inches long).

RCA and Anaconda Develop New UHF Transmission Line For the TV Industry

Pioneering in design and development of TV lead-in lines by **RCA** and the **Anaconda Wire & Cable Co.** has resulted in the selection of the new Anaconda UHF line (ATV-270) for the first commercial ultra high frequency telecasts. The new line, which is being made available to the entire television industry, is being used successfully in Portland, Ore. for reception of programs telecast from KPTV.

★ ★ ★

Development of the new line resulted from continuous consultation and cooperation between the UHF engineers of the two companies, with **Lawrence C. Ebel** responsible for "Follow-through" on the project for Anaconda, and **J. D. Callaghan** for RCA. Mr. Ebel is supervisor of Anaconda's Electrical Laboratory; Mr. Callaghan is assistant to the Chief Engineer, RCA Service Co., Inc.

★ ★ ★

The design was adopted by RCA for use in the first commercial UHF telecast installation on the West Coast because it was found to be the most reliable available (lowest losses under adverse weather conditions). It has been tested and found equally reliable over the entire range of both UHF and VHF channels.

Portable Riveting Unit Uses Unusual Remote Valve Control

The Manco Mfg. Co., Bradley, Illinois, manufacturers of the nationally known Guillotine line of portable hydraulic tools, announces the addition of the new Model R-20-185

If you require

precision wire straightening and cutting

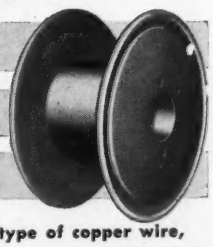
in diameter ranges from 1/16" to .005", you'll want to take advantage of the more than a decade of experience that Pittsburgh Cut Wire Company offers all industry. Regardless of what your wire straightening and cutting needs may be . . .

just call on . . .

Pittsburgh Cut Wire Co.
1120 Galveston Avenue
Pittsburgh 33, Pa.

Apco . . .

SPOOLS
REELS
BOBBINS



. . . for every type of copper wire, steel wire and wire rope application.

Leader in the industry for more than 50 years, Apco Mossberg has manufactured almost every conceivable kind of steel spools, reels and bobbins. Contact us for free engineering service — we will be glad to offer suggestions and solutions to *your* particular problems. Write today for our illustrated booklet.

Pacific Coast Representative
Gordon Proffitt
Matson Bldg., 215 Market St.
San Francisco 5, Cal.

Canadian Representative
Hugh P. Williams & Co.
47 Colborne St., West
Toronto, Ont., Canada

APCO MOSSBERG CO.
Attleboro, Mass., U.S.A.

METAL BOUND RETURNABLE REELS

Made in 12" to 24" diameters.

No nails used. *All glued construction.* Made of kiln-dried wood. Special design prevents breaking or splintering of wood, protecting insulated wire from damage.

Write for details

WILLIAM McCASKIE, INC.
FORGE ROAD • WESTPORT • MASS.
Tel.: 145 Est. 1903

RECLAIM YOUR DIAMOND POWDER

with

NATIONAL RESEARCH CO'S.

new and exclusive process. This process is more efficient and recovers higher percentages of greater purity of used diamond powders.

Diamonds from worn grinding wheels, grinding wheel sludge and dust, cotton charged with powder used in die polishing, die washings and diamond bearing scrap — all

RECLAIMED SUCCESSFULLY

Don't waste diamond bearing materials —- they're valuable.

Send it to

NATIONAL RESEARCH CO.
25530 Little Mack Avenue
St. Claire Shores, Michigan

Riveteer Unit to their expanding line of riveters.

★ ★ ★

The new unit is operated by means of a patented manual control hydraulic valve. Operator merely depresses hand lever on riveting head to produce riveting action. When full pressure (adjustable to 30 tons) is reached, valve automatically provides ram retraction. Release of valve will retract ram at any point in riveting cycle.

★ ★ ★

Manufacturer states that this new model has a capacity of 4½" x ½" rivets. Unit is powered by a 10,000 PSI hydraulic pump which operates from a 2 h.p. 220/440-volt, 3-phase motor. Yoke is removable to accommodate a variety of special operations. Use of new valve eliminates electrical switches, relays, solenoids and special valves formerly required for remote operation.

★ ★ ★

Weight of riveting unit is 65 lbs. Pump unit weighs 400 lbs. Additional information may be obtained by writing to the **Manco Mfg. Co.**, Bradley, Illinois.

★ ★ ★

New Wire Rope Produced by Leschen

A new wire rope is being manufactured by **A. Leschen and Sons Co.**, 5905 Kennerly Ave., St. Louis, Mo., that is said to have 2 to 3 times the service on hot ladle cranes. It is called the Hercules Flattened Strand Wire Rope.

★ ★ ★

The rope is a 6 x 19 or 6 x 37 round strand construction with the conventional fibre or wire rope core. Its new feature is a central triangular wire, around which wires are stranded. This gives each stranded element a triangular shape, which when in contact with a sheave groove has four wires instead of one to take the wear. Strands tend to cut each other less, the construction contains 10% more metal and is 10% stronger. The smooth surface is said to prevent corrugating or grooving of the sheave. Longer life, more even wear, greater strength for corresponding diameters and greater resistance to crushing are claimed.

★ ★ ★

PORTER CARBIDE-EDGED CUTTERS

for extremely hard materials, including stainless steel.

Stand up under the hardest usage. Tough carbide edges firmly brazed to cutting jaws. Excellent for extra hard materials like stainless steel rods, wires, pins, etc. #3 cuts to 5/16" diam. #4 cuts to 3/8" diam. Pay for themselves many times over!

ORDER THROUGH YOUR INDUSTRIAL SUPPLY HOUSE

H. K. PORTER, INC., Somerville 43, Mass.
Manufacturers of PORTER CUTTERS, PORTER PRUNERS and PORTER-FERGUSON Auto Body Fender Repair Tools

YARNS

For electric wire. Acetate, nylon and silk, natural or dyed. Put up on braider tubes, spools or cops.

OSCAR HEINEMAN CORPORATION
Division of Aetna Industrial Corp.
DONALD G. BREWSTER
President and General Manager
2701 Armitage Avenue, Chicago 47, Illinois

CONCORD BRANCH
20 N. Kerr St., Concord, N. C.

Sales Agents

C. D. GOTT CO.
1001 Provident Bldg., Chattanooga, Tenn.
Tel. 7-8879

THOMAS C. ASSHETON CO.
11 West 42nd St., New York 18, N. Y.
Tel. PE 6-8280

FRANK LUNDAY
P. O. Box 1154, Charlotte, N. C.
Tel. Charlotte 8100

Lindberg Goes West

Lindberg Engineering Company, 2450 W. Hubbard Street, Chicago 12, Ill., manufacturers of industrial heat treating furnaces and supplies, has purchased 4½ acres of land adjoining the Southern Pacific Railroad tracks in Los Angeles, California.

★ ★ ★

The company plans the building of a plant and offices for the manufacture of all types of Lindberg Heat Treating and Lindberg-Fisher Melting Furnaces as soon as possible.

★ ★ ★

Complete manufacturing equipment will include a railroad siding and cranes for loading and unloading of heavy units.

Reynolds Adds To Capacity At Longview

With scarcely a change in the external appearance of its plant at Longview, Washington, the **Reynolds Metals Company** has increased the installation's capacity from 60 million to 100 million pounds of pig aluminum per year, while maintaining aluminum production.

★ ★ ★

This significant contribution to the nation's production of aluminum was accomplished by enlarging the Longview plant's 372 reduction "pots" — electrolytic cells in which alumina is reduced to metallic aluminum. The expansion operation was begun in February, 1952.

New Folders Describes X-ray In Wire Production

A new 4-page folder titled "X-Ray Helps Produce Better Wire by New Methods Which Analyze Crystal Structure of Base Metals" is available gratis from **C. J. Woods, North American Philips Company, Inc.**, 750 South Fulton Avenue, Mount Vernon, N. Y.

☆ ☆ ★

Illustrated with photos, drawings and charts, the new folder describes operating principles for X-ray film diffraction, the Geiger-counter X-Ray Spectrometer, and the X-Ray Spectrograph (fluorescence analysis). Application of the three techniques to problems involving metals and wire is also discussed.

MUSIC WIRE and SPECIAL WIRES

Music Wire for Industrial Purposes

In Over 100 Sizes, Polished and Tinned, from .0015" to .359" in dia.

Aluminum — Annealed — Belt Lacing — Brass, Soft and Spring — Copper, Bare and Tinned Coppered Steel Spring — Galvanized — Tinned Monel — Nickel Silver — Pure Soft Nickel — Oil tempered, Steel Spring, Black Finish Phosphor Bronze, Spring Temper — Picture Wire — Iron Wire, Pure — Resistance Wire, Hoskins Chromel "A" — Stainless, Soft and Spring Temper — Tag Wire, 1000 in an Envelope — Florist Wire — Spooled and Coiled, ¼-½-1-5#

Wires Straightened and Cut to length — Small Gauges — Small orders our specialty Wires and Strands for the fishermen. Trolling Wires, Copper-Monel-Stainless. Leader Wires, "Wilstabrite" Stainless and "Silverbrite" Music.

THE MALIN & COMPANY

2514 Vestry Ave. Established in 1884 Cleveland 13, Ohio

TUNGSTEN CARBIDE WIRE DRAWING DIES

DESIGNED FOR LONG LIFE AND MAXIMUM WIRE PRODUCTION

Furnished semi-finished to within .001" to .002" of finished size at rough-drilled die prices. Require only light sizing and polishing before using. Our dies embody special design features that make for superior performance.

Also, a full line of carbide tooling for the Cold Heading Industry

EASTERN CARBIDE CORPORATION

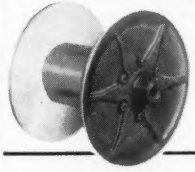
NEW ROCHELLE, N. Y.

MILTON MACHINE

RUGGED in design... DEPENDABLE in service!

Save on replacement and maintenance!

RUGGED STEEL HEAVY DUTY PROCESSING REELS



Having trouble with light weight reels failing in heavy duty service? Send us a sketch or print stating the limiting dimensions and service required, we'll be glad to tell you about our facilities for supplying the wire rope and cable industry with special heavy duty processing reels, spools or bobbins. WRITE FOR BULLETIN 52-W.

MILTON MACHINE WORKS, Inc.

DESIGNERS — ENGINEERS — MANUFACTURERS

MILTON • PENNA.

REELS SPOOLS

ALL SIZES

WOOD-PLYWOOD-WOOD-METAL

RETURNABLE NON-RETURNABLE

Samples and Prices on Request

DURKEE MFG. CO. PINE RIVER, MINN.

FOR 100 PER CENT
SATISFACTION
USE **WEDGE** REELS*
MADE BY
CARRIS REELS, INC.
SPECIALISTS IN NON-RETURNABLE REELS
RUTLAND, VERMONT
*Pat. Pending

***Buy the Best:* MONTGOMERY SILVER-COATED COPPER WIRE**
Round—Hard or Annealed on Spools. Plain or Stranded for HOOKUP and UHF CABLES.
Flat—For Tinsel Ribbons and Tinsel Garlands.
ALSO
Bare Electric Tinsel Conductors for Telephone-Razor-Hearing Aid Cords.
WRITE FOR DETAILS
Send for samples and engineering data.
THE MONTGOMERY COMPANY
25 Canal St., Windsor Locks, Conn. Tel.: 2-3338

WIRE PLANT WANTED:
50 man shop or smaller, complete with Braiders and Extruders, located in the New England section.
Advise in detail regarding equipment and products made.
H. LEACH MACHINERY COMPANY
387 Charles Street, Providence, R. I.

Cut Your Product Cost . . .
Stop struggling with wire worries. There's a Continental wire to help cut product costs — to add sales appeal. Let us know about your problem . . . Let Continental's helpful wire service work for you.
CONTINENTAL STEEL CORP.
STEEL
CONTINENTAL
WIRE
KOKOMO, IND.
*Trade Mark Reg. U. S. Pat. Off.
CONTINENTAL STEEL
CONTINENTAL STEEL CORPORATION
GENERAL OFFICES • KOKOMO, INDIANA
PRODUCERS OF Manufacturer's Wire in many sizes, shapes, tempers and finishes, including Galvanized. KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

Diamond Wheels

A 36-page catalog giving list prices, specifications, information on how to order and data on how to use diamond wheels, has been published by **Diamond Tool Research Co., Inc.**, 305 East 45th St., New York 17, N. Y. This new catalog describes and illustrates a very complete line of diamond wheels and hones, as well as listing other products sold by the company, such as industrial diamonds, diamond powders and diamond tools. Copies of this useful book will be sent upon request to interested persons.

New Booklet Available On X-ray Analysis

A new 8-page booklet titled "Facts and Figures on Three Powerful X-Ray Tools for Non-Destructive Analysis" is available gratis from C. J. Woods, Research and Control Instrument Division, **North American Philips Company, Inc.**, 750 South Fulton Avenue, Mount Vernon, N. Y.

★ ★ ★

Diagrams are used to show the principles of operation for the three instruments, data is given on recommended fields of application, and results to be obtained are explained.

★ ★ ★

In addition, the booklet clearly illustrates how the simplest film diffraction unit consisting of the basic X-ray generator plus a camera can be converted to Spectrometer and Spectrograph use through the addition of these components.

PLACE YOUR ORDER NOW FOR YOUR ADVERTISING IN
JANUARY
The Convention Proceedings and Annual Forecast Issue.
Contains discussions of papers recorded during the Annual Convention and other special features, which give you extra-special advertising value. Write today for rates and other information.
WIRE & WIRE PRODUCTS
453 MAIN ST.
STAMFORD, CONN.

WOOD REELS

• • •

That's Our Business

• • •

We make them well
We make them fast
We make them right
AT THE RIGHT PRICE

Reels from 12" dia. up

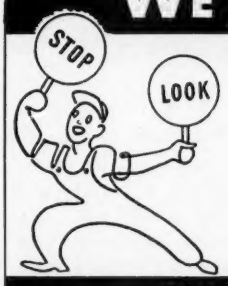
• • •

Canadian firms in the market for reels should contact

The J. HAMELIN
LUMBER & WOODWORK LTD.
Lachine, Que.
Tel. NElson 5-4074
ESTABLISHED 1938

"HEY POP— WHY DON'T YOU USE MAGNUS HAND CLEANER"

WE BUY WE SELL



We Pay Highest Prices for Used Machinery
2 #0 WATERBURY-FARRELL
7-DIE ROD WIRE
DRAWING MACHINES
1 NEBCO 7-WIRE STRANDER
18"x10" Spools in Cradles—54" TAKE-UP STAND
Complete with 20-HP SLIP-RING MOTOR and CONTROLS
All Machines Reconditioned in Our Own Shop

WIRE & TEXTILE MACHINERY INC.
P. O. BOX 436, PAWTUCKET, R. I.

Improved Lime Bath Performance By Recirculation

(*Continued from page* 1187)

While the completion of the tests for this project and the evaluation of the results will yield valuable information, there still remain many other phases of the application of lime and the performance of a lime bath which are open to investigation. A worthy contribution to improved lime bath control would be made by the development of a series of tests other than chemical analysis, settling rate, and screen analysis to evaluate a quicklime more accurately according to its relative performance in a lime bath after the initial hydration. Although the chemistry of the lime hydration process is relatively simple, there exists a need for a practical explanation of the mechanisms by which the hydrated particle changes in character during the so-called aging process. Finally, although the results of the work done in connection with the theory that lime adhesion is affected by the alkalinity of the filtered solution from a lime bath were not consistent, there were, at least, indications to substantiate this theory.

★ ★ ★

Additional work on this phase of the problem, as well as others, would most certainly result in improved lime bath performance and better lime coatings.

Describes Cold Header Lubricant

The September issue of "The Houghton Line", published by **E. F. Houghton & Co.**, 303 W. Lehigh Avenue, Philadelphia 33, Pa., carries a page of text describing Sta-Put lubricants in the manufacture of bolts and nuts.

★ ★ ★

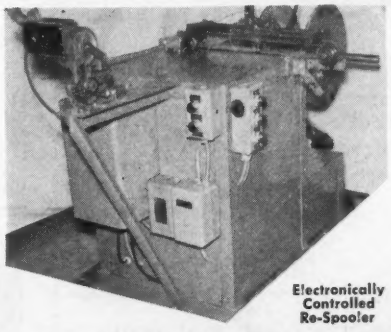
DRAWING STAINLESS STEEL WIRE?
See Page 1217

DOUBLE YOUR PRODUCTION

THIS MACHINE FEATURES:

- *ELECTRONIC CONTROLS*
- *VARIABLE SPEED*
- *CONSTANT FOOTAGE*
- *AUTOMATIC ACCELERATION*
- *PUSH BUTTON CONTROL*
- *ELECTRIC BRAKE*
- *TRAVERSE GIVES CONSTANT LAY WITHOUT GEAR CHANGING*
- *RIGHT OR LEFT HAND DESIGN*

YOUR INQUIRIES INVITED


Electronically Controlled Re-Spooler

WIRE INSULATING MACHINERY, INC.
260 TOLLAND TPKE—STATION "A" MANCHESTER, CONN.

Non-Ferrous Division Holds First Session in Waterbury

(*Continued from page* 1174)

expenditures in paper work must be reduced.

* * *

Mr. Goss advocated a careful study of markets and sales territories, so that when a territory is assigned to a man, it will not be so big that he cannot cover it adequately, nor will it be so small, from the standpoint of possible sales results, that he cannot justify his income. The determination of territory potentials, he thought, was a home office responsibility that would be particularly needed when the competitive selling era is reached, in order to sell efficiently.

* * *

The technical papers are published elsewhere in this issue of Wire and Wire Products. No transcripts of the discussions were made.

* * *

This meeting, at which 100 to 125 were expected when plans were first formulated, resulted in 223 registrations, although some 235 had sent in cards indicating their intent to be present. Approximately half of the people attending were electric wire cable men.

* * *

Surprisingly, many persons came from long distances away—from the south and mid-west, as well as from Canada. The committee was much pleased to have, besides Red Crewe, Ralph B. Roth, Vice President of the Ludlow Saylor Wire Company in St. Louis, who is the non-ferrous Vice President of the Association.

* * *

BALLOFFET VIANNEY WIRE DIE CO., Inc.

Large stock on hand of domestic and imported dies available for immediate shipment in sizes from .0004" to .081".

Manufacturers of Quality Diamond Dies since 1870

BALLOFFET VIANNEY WIRE DIE CO., Inc.
6825 ADAMS ST., GUTTENBERG, N. J.
Tel: Union 3-3393

DIAMOND WIRE DRAWING DIES and DIAMOND POWDER
INDIANA WIRE DIE COMPANY
314-324 E. Wallace St., Fort Wayne, Indiana
Phone: Harrison 4373

DIAMOND DIES
QUALITY HIGH—COST LOW
VICTOR J. BOULIN INC.
250 E. 43rd St., New York 17, N.Y.
Phone: ORegon 9-2578

Wire Drawing Diamond Dies

COCHAUD WIRE DIE CORPORATION
300 W. 56th St., NEW YORK
Tel. COlumbus 5-1340

DIAMOND DIES .0006 - .120 INDUSTRIAL DIAMOND POWDER
AJAX SUPPLIES INC.
R.R. 4, P. O. Box 66, Fort Wayne, Ind.

NEW ENGLAND WIRE DIE CO.
7 Forsberg St., Worcester, Mass.
EXPERT RECUTTING
DIAMOND DIES, DIAMOND POWDERS
Eastern Representative of Ajax Industrial Supplies, Inc.

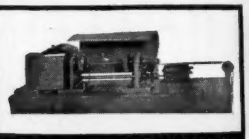
DIAMOND AND CARBIDE WIRE DRAWING DIES
DIAMOND POWDER
RUSCH WIRE DIE CORPORATION
Croton-on-Hudson, N. Y.

Diamond Dies
Guaranteed Perfect for Any Wire Drawing
Hoosier Wire Die Inc.,
P. O. BOX 423 FT. WAYNE, IND.

GET THE BEST IN REELS
HOWSAM SPOOL COMPANY
AURORA • ILLINOIS
Exclusive Feature: "Pressure Pad" Fasteners. Patent applied for.

ZINC STRIP AND WIRE
THE PLATT BROS. & CO.
WATERBURY 20, CONN.

MODEL T-3 TORSION TESTER FOR WIRE



SCOTT TESTERS INC. 55 BLACKSTONE ST. PROVIDENCE 1, R.I.

DIAMOND DIES CARBIDE
KELLY
WIRE DIE CORPORATION
19 W. 34th St. New York

DIAMOND DIES
.000's to .102"
For many years . . .
Outstanding in quality, workmanship and service.
FORT WAYNE WIRE DIE, INC.
2625 E. Pontiac St., Fort Wayne, Ind.

Diamond Dies for Wire Drawing
Wayne Wire Die Company
200 Pennsylvania Ave.
Hillside, N. J.
Elizabeth 2-2456

WIRE ANNEALING FURNACES and PROCESSES
COIL LOADING and STRIPPING MACHINES—WIRE SPIDERS
LEE WILSON ENGINEERING CO., INC.
Cleveland, Ohio • EDison 1-6600

SLEEPER & HARTLEY, Inc.
Designers and Builders
SPRING COILERS
WIRE WORKING MACHINERY
WIRE MILL EQUIPMENT
SPECIAL MACHINERY
Address Inquiries to
WORCESTER, MASS.

DRAWING LOW CARBON STEEL WIRE?
See Page 1219

ACROPAK
Drawn Aluminum Alloy Spools for Precision Wire Packaging. Also Steel Spools for heavy duty processing.
ACROMETAL PRODUCTS, INC.
604-5 St., N., Minneapolis 1, Minn.

Wire Measuring...
PRODUCTIMETERS
Send for Catalog No. 40
Precision-built for accuracy and speed. Most complete line offered
DURANT MANUFACTURING CO.
1918 N. Buffum Street, Milwaukee 1, Wisconsin • 118 Orange Street, Providence 3, R. I.

WIRE SPOOLING MACHINERY
ALL TYPES—ALL SIZES
ROBERT J. EMORY COMPANY
Sherman Ave., & Runyon St.
Newark 5 N. J.

GET THE BEST IN REELS
HOWSAM SPOOL COMPANY
AURORA • ILLINOIS
Exclusive Feature: "Pressure Pad" Fasteners. Patent applied for.

WIRE { STRAIGHTENED AND CUT TO LENGTH
"Straight As An Arrow"
ERIE IRON & SUPPLY CORPORATION
1059 East Buffalo Road • Erie, Penna.
Phones 4-7139, 2-2503

The committee, through whose diligent efforts this first meeting was brought to successful fruition, was as follows:

General Chairman

WILLIAM L. WELLS, Asst. Supt. Rod Mill
Scovill Manufacturing Co., Waterbury, Conn.

Chairman, Bare Wire Section

WILLIAM L. WELLS, Asst. Supt. Rod Mill
Scovill Manufacturing Co., Waterbury, Conn.

Members

KENNETH D. ROBERTS, The Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

CHRISTIAN WITTEVELD, JR., Met. Bridgeport Brass Company, Bridgeport, Conn.

EDWARD O. JOHNSON, Thomaston, Conn.

Chairman, Electric Wire & Cable Section

JAMES E. FLOOD, Chemical Eng. Plastic Wire and Cable Corp., Jewett City, Conn.

Members

BENJAMIN H. DAVIS, Standard Machinery Co., Mystic, Conn.

CARL H. JUDISCH, Plant Eng., Whitney Blake Co., Hamden, Conn.

WILLARD de C. CRATER, Naugatuck Chemical Div., U. S. Rubber Co., Naugatuck, Conn.

Ex-Officio Member

RICHARD E. BROWN, Exec. Secy., The Wire Association and Publisher of Wire and Wire Products

★ ★ ★

FLASH BAKER
New, Improved, Compact, Low Cost Unit Bakes Faster—Requires Less Maintenance. Gas or Oil Fired. Shipped Completely Assembled.
MORRISON INDUSTRIES, INC.
engineers & builders of industrial process equipment
17100 MILES AVE. • CLEVELAND 28 OHIO

DIAMOND POWDER
Industrial Diamond Powders Incorporated
Box 613, New Kensington, Pa.

Wire Drawing Machinery
Featuring —
High Speed Upright Cone Machines.
Also —
Bull Blocks and Benches, Continuous Wire Drawing Machines, Spoolers, Pointers, String-up Machines, etc.
And —
Cold Heading Machinery.
WATERBURY FARREL FOUNDRY & MACHINE CO.
Waterbury, Conn.

CHEMSTEEL CONSTRUCTION COMPANY, INC.
205 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.
Send data on Engineering & Construction facilities for
ACID-ALKALI-PROOF CONSTRUCTION
of pickling and other tanks; flooring.
(TEAR OUT & MAIL WITH LETTERHEAD)

DANFORTH DIAMOND POWDER
Complete Reclaiming Services
Pat. applied for
THE C. W. DANFORTH CO.
(Established 1912)
Box 448 Youngstown, Ohio

CLEVELAND TRAMRAIL
Division of
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE, OHIO
Leading manufacturers of
OVERHEAD MATERIALS HANDLING EQUIPMENT
for the Wire and Wire Products Industry

DRAWING FINE COPPER AND BRASS WIRE?
See Page 1222

CAM MILLING • **JIG** BORING

A SPECIALIZED CAM MILLING SERVICE
JIG BORING . . . SPOT WELDING . . . CONTRACT PRODUCTION . . . EXPERIMENTAL DEVELOPMENT
EISLER ENGINEERING CO., Inc.
747 A So. 13th St., Newark 3, N.J. U.S.A.

Immediately Available
WIRE WORKING MACHINERY
FOURSLIDES: Baird, Nilson & Manville, Nos. 0, 1, 2, 3, 4, 5, 3-20, 4-26
U. S. Tool Co. No. 22, 28, & 33 Multislides
Sleeper & Hartley Spring Coilers Nos. 0, 1, 2, 3, 3½, 4, & 5
Vaughn Nos. 8, 10, & 12 Moto-Blocs
Waterbury No. 3 Bull Blocks, Duplex
Morgan 4 stand Wire Drawer with pointer and 100 H.P. motor drive & motor
Waterbury Nos. 1, 2, & 3 Continuous Wire Drawing Machines
PARTIAL STOCK LISTING
"The most diversified stock of machinery in the country. If it's machinery we have it."
National Machinery Exchange
130 Mott St., New York 13, N. Y.
CAnal 6-2470

TOOLS TALIDE DIES
WEAR PARTS
Talide Metal, the super hard tungsten carbide gives increased production, better finish, less down time and scrap on all wire mill operations.
METAL CARBIDES CORPORATION
YOUNGSTOWN 5, OHIO

WOOD REELS and SPOOLS
AMERICAN WOODWORKING COMPANY
1" to 60" Diameters
OVER 50 YEARS EXPERIENCE
1674 No. Lowell Avenue
Chicago, Ill.

GET THE BEST IN REELS
HOWSAM SPOOL COMPANY
AURORA • ILLINOIS
Exclusive Feature: "Pressure Pad" Fasteners. Patent applied for.

PROBLEMS IN WET DRAWING WIRE?
See Page 1225

HAVEG CORPORATION
NEWARK 47, DEL.
Manufacturers of Pickling and Plating *Corrosion-Resistant* Equipment

NEBUTT CO
MACHINERY FOR HIGH SPEED PRODUCTION
BRAIDERS CABLERS TAKE-UPS BUNCHERS STRANDERS TAPING MACHINES
NEW ENGLAND BUTT COMPANY
304 Pearl Street, Providence 7, R. I.
James Day (Machinery) Ltd., 28 Maddox Street, London W1, Eng.

101 ENGINEERING VERSATILITY
Engineered Application of Heat in Continuous Materials Handling Systems
INDUSTRIAL OVENS, INC.
13825 TRISKETT ROAD
CLEVELAND 11, OHIO

For Sale — Wire Equipment
100—16,20 & 24 carrier Butt Brders.
16—32 carrier Butt braiders
45—44 carrier Butt braiders
100—N.E.B. & Wardwell 18" sheaves
2—Universal #50 Tube Winders
2—Hask.—Dawes 12 Gang Twisters, 5 x 7" spools
Dealer in Wire & Textile Equipment
Michael Solomon
131 Spring Street New York 12, N. Y.
Rector 2-9364

The congratulations, gratitude and thanks of the officers and directors of the Association are hereby expressed to these committees for their splendid work. A hope was expressed by the able general chairman that this may not be the last meeting in Waterbury. Bill still wants to give his industrial co-freres an opportunity to visit their mill—and from all reports, it will be something to see.

★ ★ ★

Because the Scovill mill could not be seen, the company distributed an illustrated brochure entitled "Better by the Mile," describing the new continuous casting process that was installed by them two years ago. They have also promised to send each person who registered a book, now in the process of being readied for publication, outlining the long and interesting growth of the company.

★ ★ ★

For this meeting a general invitation to attend had been issued to all non-ferrous bare and electric wire men, regardless of membership in the Association. This was done to acquaint more men with the workings of the Association. Many applications for membership were made at the meeting; others who attended are cordially invited to affiliate themselves with the organization and enjoy its benefits.

★ ★ ★

WIRE DRAWING MACHINERY AND EQUIPMENT
Rod Frames — 16" Frames, 8" Frames — Take-Up Frame, Wire — Pointers — Puller Tongs. — General and heat resisting alloy castings for wire mill use.
Circulars on Request.
E. J. SCUDDER FOUNDRY & MACHINE CO.
TRENTON, N. J.

TRAUWOOD
Patenting, Annealing, Tempering, Galvanizing, and Tinning equipment for wire.
TRAUWOOD ENGINEERING CO.
Cleveland, Ohio.

STANDARD UNI-DRIVE WIRE WINDER
WILL INCREASE YOUR PRODUCTION
Write for details.
STANDARD MILL SUPPLY
1066 MAIN ST. • PAWTUCKET, R. I.

WIRE and PROCESS MACHINERY
Custom Machinery Engineered to Suit Requirements of User.
HUGHESVILLE MACHINE & TOOL CO.
Hughesville, Penna.

THE NEWBURY CO.
High and Low Carbon Steel Wire
UNION WHARF • BOSTON 13, MASS.
Tel.: Richmond 2-2277

WOOD & PLYWOOD REELS
for WIRE ROPE and INSULATED WIRE & CABLE
THE NELSON COMPANY
Standard Oil Bldg., Baltimore 2, Md.

WOOD REELS
STANDARD - METAL-BOUND - SPECIAL
for
WIRE, WIRE ROPE and CABLE
NORTH ANSON REEL CO.
NO. ANSON, MAINE

'Surface' HEAT TREATING FURNACES •
FOR FERROUS AND NON-FERROUS WIRE.
PREPARED ATMOSPHERE GENERATORS
SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

NEP • SUMFOAM
ACID INHIBITOR • PICKLING COMPOUND
THE PARKIN CHEMICAL CO.
HIGHLAND BLDG. PITTSBURGH 6, PA.

STILL USING LIME FOR WIRE COATING?
See Page 1227

WORLD'S LARGEST MANUFACTURER
SPIRAL WRAPPING MACHINES
For Coils or Straight Lengths
Terkelsen Machine Company
323 A Street, Boston 10

Wire Drawing Machines.
Galvanizing & Tinning Installations.
Wire Flattening Mills.
Spooling Machines.
STEEL EQUIPMENT CO.
P.O. Box 737, Warrensville Station
Cleveland 22, Ohio

Engineering and Professional Services

LANCASTER, ALLWINE & ROMMEL
REGISTERED PATENT ATTORNEYS
Suite 438, 815—15th St., N. W.
Washington 5, D. C.

●

Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions.

Booklet and form "Evidence of Conception" forwarded upon request.

CONSULTANT AND SPECIALIST

DRAWING LUBRICANTS

Hans C. Bick, Inc.
READING, PA.

KENNETH B. LEWIS
CONSULTING ENGINEER
Wire Mill Equipment, Layout and Practice
43 Midland St., Worcester, Mass.
Phone: Worcester 5-6033

FOR CORROSION AND FATIGUE TESTING OF WIRE, SEND SAMPLES AND STATEMENT OF YOUR PROBLEM TO

Fatigue of Materials Laboratory
BOX 367, PRINCETON, N. J.
Fees upon request

WALLACE G. IMHOFF CO.
CONSULTANTS IN
ZINC COATINGS
5617 Canary Drive
NORTH HIGHLANDS • CALIFORNIA

USED EQUIPMENT FOR SALE

WIRE DRAWING MACHINES:

9 20 Draft Superior continuous draft wire drawing machines. Finish size #25 to #40, no blocks. 1300 RPM—equipped with 15 H.P. motor on each machine. EACH $1200.00

1 Superior wire pointer and die stringer, with 1½ H.P. motor, 3 phase 60 cycle. 220/440 volts. $250.00

5 Draft Sleeper & Hartley Flat Bed continuous wire drawing machines for drawing 12 to 20 gauge wire. Gear reducers on each machine for dry wire drawing. Capstan 8" speed 600 RPM opens gears. Finishing block 8", or 16". Driven from lineshaft. No electrical equipment. EACH $500.00

SPOOLING MACHINE:

1 Fidelity 2 head double end screw traverse spooling machine #11413, each unit with four 7/16" removable spindles—equipped with 6 driving collars for wood spools ¼ to 1# of wire, 2 independent heads of 12 small spools with 1⅝" traverse or 8 large spools. Automatic measuring on each unit. Practically new. $875.00

FILTERS-OIL:

3 Fig. 674-5 oil filters-Bowser, Inc., Fort Wayne, Indiana, with three 0 to 100# pressure gauges for filtering dwg. oil. $1500.00

SPOOLS:

8,000 Curled Flange Steel spools, 7" diameter head, 6" traverse, 3" Arbor, 49/64" hole. EACH $1.00

FURNACES:

Pots—lead: 2 Sunbeam-Stewart #29088 lo wcarbon steel lead pots 18" wide at top, 72" long, 8" deep ISD. Pot is bent 8½" radius and equipped with 4" flange completely around top. Constructed with low carbon steel 1" thick. (Made by Columbiana Bailer Co.)

1 fabricated pot furnace, steel casing, brick lined, 55" x 43" over-all. Pot 48" x 19" x 15" deep. Does not include burners.

1 Dewey Gas Furnace for heating molten zinc for hot dip galv. Pot 51" x 19" x 18" deep. Includes heating equipment.

For Morgan Rod Machine:

			Each
3	Drawheads 22"	(Slightly used)	90.00
1	Finishing Block 22"	(Slightly used)	90.00
5	Domes to hold block to line shaft.	(Domes and Spindles new)	40.00

Above are FOB Fostoria
Subject to prior sales and inspection.

Seneca Wire & Manufacturing Co.
FOSTORIA, OHIO, U. S. A.

Wanted complete machinery for making welded steel wire fabric.

Reply Box 661,
c/o WIRE AND WIRE PRODUCTS

INSULATED WIRE ENGINEER

Wanted by small insulated wire mill near New York City. Should be experienced on JAN specs., braiding and vinyl plastics. Excellent opportunity. State full details in reply.

Reply Box 662
WIRE AND WIRE PRODUCTS

ELECTRICAL CORD SET FOREMAN WANTED

Experienced to take charge of cord sets and electrical small parts department. Excellent opportunity. Near New York City. Reply in complete detail to:

Box 663
WIRE AND WIRE PRODUCTS

WIRE MAN WANTED

Small Wire Rolling Shop in New York Metropolitan Area desires to expand into Shape Rolling and Wire Drawing. Need man experienced in all phases to take charge and guide expansion. Opportunity. Reply Box 664
WIRE & WIRE PRODUCTS

WANT THE FACTS ON WIRE DRAWING COMPOUNDS?
See Page 1228

WIRE ROPE ENGINEER available

18 years experience in cordage, wire rope, wire and tungsten carbide production in Germany, Sweden, Norway, Mexico and U. S. in leading positions and consulting work. Interested in permanent position. Single. Now located in Norway. Reply to Box 665, WIRE & WIRE PRODUCTS.

Index to Advertisers

A

Acrometal Products Inc. 1237
Aetna-Standard Eng'g Co., The 1166
Ajax Industrial Supplies, Inc. 1236
American Chemical Paint Company ..... 1195 and 1202
American Insulating Machinery Company 1210
American Steel & Wire Div., U. S. Steel Company 1155
American Woodworking Co. 1238
Anchor Wire Corp. 1218
Angier Corporation, The 1231
Apco Mossberg Company 1231
Arkell Safety Bag Co. 1207

B

Baird Machine Co., The 1154
Balloffet-Vianney Wire Die Co., Inc. 1236
Bethlehem Steel Company 1150
Bick, Hans C., Inc. 1239
Boulin, Victor J., Inc. 1236
Boyd & Sons Mfg. Corp. 1218
Bridge Mfg. Co. 1162

C

Carboloy Dept. of General Electric Co. ..... 1192 and 1193
Carl-Mayer Corp., The ..... 1220 and 1221
Carris Reels, Inc. 1234
Chase Brass & Copper 1165
Chemsteel Construction Co., Inc. 1237
Cleveland Tramrail Division of the Cleveland Crane & Engineering Co. 1237
Cochaud Wire Die Corp. 1236
Continental Steel Corporation 1234
Cook Mfg. Co. 1230

D

Danforth Co., C. W., The 1237
Davis Electric Co. 1168
Diamond Tool Research Co., Inc. 1229
Durant Mfg. Co. 1237
Durkee Mfg. Co. 1233
Dykrex Corporation of America—Roos Tool & Mfg. Div. 1217

E

Eastern Carbide Corp. 1233
Eisler Engineering Co., Inc. 1237
Electric Furnace Company, The ..... Back Cover
Electronic Rubber Co. 1220
Elgin National Watch Co., Abrasives Div. 1157
Emory, Robert J. Company 1237
Entwistle, James L., Co. ..... 1172 and 1209
Erie Iron & Supply Corp. 1237

F

Fatigue of Materials Laboratory 1239
Federal Mfg. Co. 1206
Fidelity Machine Co., Inc. 1196
Firth Sterling, Inc. 1149
Fisher Associates 1221
Fort Wayne Wire Die, Inc. 1236

G

Gerber J. & Co., Inc. 1219
Glader, Wm. Machine Works 1203

H

Hamelin Lumber & Woodwork Ltd., J., The 1235
Haskell-Dawes Machine Co., Inc. 1223
Haveg Corporation 1238
Heineman Corp., Oscar 1232
Holden, A. F. & Co. 1160
Hoosier Wire Die, Inc. 1236
Howsam Spool Company ..... 1236, 1237 and 1238
Hughesville Machine & Tool Company 1238

I

Imhoff, Wallace G., Co. 1239
Indiana Wire Die Company 1236
Industrial Diamond Powders, Inc. 1237
Industrial Ovens, Inc. 1238
International Paper Company, Container Division 1159

J

Johnson Steel & Wire Co., Inc. 1198

K

Kelly Wire Die Corporation 1236
Keystone Steel & Wire Company 1200
Kilmer, M. D. & Co. 1231

L

Lancaster, Allwine & Rommel 1239
Lewis, K. B. 1239
Lewis Machine Company, The 1213

M

Magnus Chemical Co., Inc. ..... 1217, 1219, 1222, 1225, 1227, 1228, 1230, 1235, 1237, 1238 and 1239
Malin & Company, The 1233
Malmedie Maschinenfabrik 1204
Marshall-Richards Machine Co., Inc. 1163
Mason Can Company 1227
McCaskie, Wm., Inc. 1232
Metal Carbides Corporation 1238
Metal and Thermit Corporation 1228
Mettler Machine Tool, Inc. 1211
Meyer, Roth & Pastor 1206
Micro Products Company 1194
Michigan Oven Co. 1229
Miller, R. H. Co., Inc. 1164
Milton Machine Works, Inc. 1233
Montgomery Co., The 1234
Morgan Construction Company 1152
Morgardshammars Mek. Verkstads AB 1161
Morrison Industries Inc. 1237
Mossberg Pressed Steel Corp. 1210

N

National Machinery Exchange 1237
National Research Co. 1232
National Rubber Machinery Co. 1205
Nelson Company, The 1238
New England Butt Company 1238
Newbury Co., The 1238
New England Lacquer Co. 1225
New England Wire Die Co. 1236
Niles Steel Products Div., Republic Steel Corp. 1153
Nopco Chemical Co. 1216
North American Philips Co., Inc. 1226
North Anson Reel Co. 1238
Norton Co. 1226

P

Pacific Coast Borax Company 1222
Parkin Chemical Co., The 1238
Pittsburgh Cut Wire Company 1231
Pittsburgh Steel Company 1167
Platt Brothers & Co., The 1236
Porter H. K., Inc. 1232
Pourtier Freres, Ets. 1214

R

Rockwell, W. S., Co. 1230
Roebling's John A. Sons Company 1169
Royle, John & Sons 1197
Rusch Wire Die Corporation 1236

S

Scott Testers, Inc. 1236
Scudder, E. J. Foundry & Machine Co., Inc. 1238
Sjogren Tool and Machine Co., Inc. 1224
Sleeper & Hartley, Inc. 1237
Solar Compounds Corporation 1201
Solomon, Michael 1238
Standard Industrial Compounds Co. Inc. 1151
Standard Mill Supply Co. 1238
Steel Equipment Co. 1238
Surface Combustion Corp. 1238
Syncro Machine Company 1156

T

Terkelsen Machine Co. 1238
Torrington Mfg. Co. 1199
Trauwood Engineering Co., The 1238

U

United States Steel Co., American Steel & Wire Div. 1155

V

Vascoloy-Ramet Corporation 1170
Vaughn Machinery Company ..... Front Cover

W

Wafios Maschinenfabrik 1214
Wartenweiler, Emilio 1212
Waterbury Farrel Foundry & Machine Co. 1237
Watson Machine Company ..... Third Cover
Wayne Wire Die Co. 1236
Wean Equipment Corporation ..... Second Cover
Wells, Frank L. Co. 1208
Wilson, Lee Engineering Co., Inc. 1236
Winchester Reel Co., Inc. 1224
Wire & Textile Machinery, Inc. 1235
Wire Insulating Mach'y Inc. 1235

Y

Youngstown Sheet & Tube Company, The 1158

WHERE TO BUY

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.
Only advertisers who have contracted for six or more insertions are listed in this section.

ABRASIVES—
Ace Abrasive Laboratories, New York, N. Y.
Elgin National Watch Co., Abrasives Division, Elgin, Ill.
Norton Co., Worcester, Mass.

ACID INHIBITORS—
(See Inhibitors, Pickling)

ACID-PROOF CONSTRUCTION—
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corporation, Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio

ANNEALING MACHINES — Electric Resistance
Syncro Machine Co., Perth Amboy, N. J.
Trauwood Engr. Co., Cleveland, O.

ANNEALING POTS AND BOXES—
Scudder, E. J. Foundry & Mach. Co., Trenton, N.J.

BAKERS—(See OVENS—Rod Bakers)

BOBBINS—Braider & Wire Weaving
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

BORAX—Wire Drawing
Pacific Coast Borax Co., New York, N. Y.

BORON CARBIDE—
Norton Co., Worcester, Mass.

BRAKES—Pneumatic
Entwistle, Jas. L. Co., Providence, R. I.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

CARTONS—Paper
(See CONTAINERS—Paper, for nails, etc.)

CASTINGS—Wire Mill
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.

CEMENTS—Acid Proof
Ceilcote Company, Cleveland, Ohio

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
Magnus Chemical Co., Garwood, N. J.
Metal & Thermit Corp., New York, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANING & PICKLING EQUIP.—
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, O.
Haveg Corporation, Newark, Del.
Holden, A. F., Company, The, Detroit, Mich.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

CLOTH—WIRE, All Metals
American Brass Co., The, Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Roebling's, John A. Sons, Co., Trenton, N. J.
Wickwire Bros., Cortland, N. Y.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

COMPOUNDS—Coppering
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Diamond (Pre-Mixed)
Eastern Carbide Corp., New Rochelle, N. Y.
Elgin National Watch Co., Abrasives Division, Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.

COMPOUNDS—Extrusion, for Wire
(See Compounds—Vinyl)

COMPOUNDS—For Improving Drawing and Extrusion
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Metal Finishing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Metal & Thermit Corp., New York, N. Y.

COMPOUNDS—Phosphate Coating
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

COMPOUNDS—Vinyl, for Wire
Electronic Rubber Co., Stamford, Conn.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H. Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Pacific Coast Borax Co., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.
Swift & Company, Chicago, Ill.

CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

CONTAINERS—Paper, for Nails, etc.
International Paper Company, Chicago, Ill.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

CORROSION PREVENTIVE PAPERS—
Angier Corporation, The, Framingham, Mass.

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Carboloy Dept. of General Electric Co., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

CUTTING TOOLS—Wire
Manco Manufacturing Co., Bradley, Ill.
Porter, H. K. Inc., Somerville, Mass.

DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDERS—
Ace Abrasive Laboratories, New York, N. Y.
Danforth, The C. W. Co., Youngstown, Ohio
Elgin National Watch Co., Abrasives Division, Elgin, Ill.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Industrial Diamond Powders, New Kensington, Pa.
National Research Company, St. Claire Shores, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDER RECLAIMING—
Boulin, Victor J., Inc., New York, N. Y.
Danforth, The C. W. Co., Youngstown, Ohio
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Industrial Diamond Powders, Inc., New Kensington, Pa.
National Research Co., St. Claire Shores, Mich.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DIAMOND TOOLS—
Carboloy Dept. of General Electric Co., Detroit Mich.
Diamond Tool Research Co., Inc., New York, N. Y.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Wayne Wire Die Co., Hillside, N. J.

DIES—Carbide, Tungsten & Tantalum
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Cold Heading
Carboloy Dept. of General Electric Co., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Vascoloy-Ramet Corp., No. Chicago, Ill.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York, N.Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Extrusion
Carboloy Dept. of General Electric Co., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelly Wire Die Corp., New York, N. Y.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit, Mich.
Cochaud Wire Die Corp., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Dept. of General Electric Co., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS & TRAVERSES—Flange Steel
Entwistle, Jas. L. Co., Providence, R. I.
Niles Steel Products Division, Republic Steel Corporation, Niles, Ohio

DRYING EQUIPMENT—
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Rockwell, W. S. Co., Fairfield, Conn.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

ENGINEERS—Consulting
Metal Fatigue—Fatigue of Materials Laboratory, Princeton, N. J.
Wire Insulating and Rubber and Plastics Processing —Hale and Kullgren, Inc., Akron, Ohio
Wire Mill—Lewis, Kenneth B., Worcester, Mass.
Zinc—Imhoff, Wallace G., Co., No. Highlands, Calif.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCING & FENCES—Wire
Interlocking Fence Co., Morton, Ill.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio
Harper Electric Furnace Corp., Buffalo, N. Y.
Rockwell, W. S. Co., Fairfield, Conn.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engineering Co., The, Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, Detroit, Mich.
Morrison Industries, Bedford, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Pot (oil, gas, electric)
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, Detroit, Mich.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

FURNACES—Resistance Heating, Strand
(See Annealing Machines)

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

GALVANIZING EQUIPMENT — (See MACHINERY—Galvanizing Wire)

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—for Wire
Heany Industrial Ceramic Corp., New Haven, Conn.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOOKS—Pickling & Liming
Heil Process Equipment Corp., Cleveland, Ohio
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

HOISTS—Electric Travelling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, Ohio

IMPREGNATING MATERIALS—
Solar Compounds Corporation, Linden, N. J.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INSULATING MATERIALS—
Electronic Rubber Co., Stamford, Conn.
Glass Fibers, Inc., Toledo, Ohio
Heineman Corp., Oscar, Chicago, Ill.
Merrimac Paper Co., New York, N. Y.
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

INSULATING MATERIALS—Paper—For Electric Wire Cable.
Merrimac Paper Co., New York, N. Y.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

LACQUERING SYSTEMS — See MACHINERY—Lacquering Electric Wire

LACQUERS—For Electric Wire
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., Philadelphia and Bellefonte, Pa.

LUBRICANTS — For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

LUMBER—Wire Mill, Carload shipments for lagging and car blocking
North Anson Reel Co., No. Anson, Me.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Machine Works, Chicago, Ill.
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Bolts & Rivets
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany

MACHINERY—Braiding
Fidelity Machine Co., Inc., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Solomon, Michael, New York, N. Y.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Inc., Philadelphia, Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Machinery—Winding Wire)

MACHINERY—Chain Making
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
Nilson, A. H. Machine Co., Bridgeport, Conn.

MACHINERY—Closing Rope
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Waterbury-Farrel Fdry. Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., The, Hartford, Conn.
Hale and Kullgren, Inc., Akron, Ohio
National Mach'y Exch. (Used), New York, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Manco Manufacturing Co., Bradley, Ill.
Mettler Machine Tool, Inc., New Haven, Conn.
Porter, H. K., Inc., Somerville, Mass.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.

MACHINERY—Die Making
Victor J. Boulin, Inc., New York, N. Y.
Carboloy Dept. General Electric Co., Detroit, Mich.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelly Wire Die Corp., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wartenweiler, Emilio, Milano, Italy

MACHINERY—Edging (See MACHINery — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, Ohio
Michigan Oven Co., Detroit, Mich.

MACHINERY—Extruding
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
Royle, John, & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Fenn Manufacturing Co., The, Hartford, Conn.
Mettler Machine Tool, Inc., New Haven, Conn.
Stanat Manufacturing Co., Long Island City, N. Y.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Forming Wire
Baird Machine Co., Stratford, Conn.
Nilson, A. H., Machine Co., Bridgeport, Conn.

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating Wire
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
Fidelity Machine Co., Inc., Philadelphia, Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Solomon, Michael, New York, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R.I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Inc., Philadelphia, Pa.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia, Pa.
Industrial Ovens, Inc., Cleveland, O.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Interlocking Fence Co., Morton, Ill.

MACHINERY—Material Handling (See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Providence, R. I.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

MACHINERY—Nail and Tack
Baird Machine Co., The, Stratford, Conn.
Glader, Wm., Machine Works, Chicago, Ill.
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

MACHINERY—Pin Making
Baird Machine Co., The, Stratford, Conn.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale and Kullgren, Inc., Akron, Ohio
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Poultry Wire Fencing
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, O.

MACHINERY—Power Transmission
Reeves Pulley Company, Columbus, Indiana

MACHINERY—Pre-Heater for Wire (for Extrusion of Plastics)
Industrial Ovens, Inc., Cleveland, Ohio
National Rubber Machinery Co., Akron, Ohio

MACHINERY—Re-Spoolers
Boyd & Sons Manufacturing Corp., Philadelphia, Pa.
Davis Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Providence, R. I.
National Mach'y Exch. (Used), New York, N. Y.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.
Wire Insulating Machy., Inc., Manchester, Conn.

MACHINERY—Rod Mill
Morgan Construction Co., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Rubber Insulating
National Rubber Machinery Co., Akron, Ohio
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

MACHINERY—Spark Testing
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

MACHINERY—Slitting
Stanat Manufacturing Co., Long Island City, N. Y.

MACHINERY—Spring Making
Carlson Company, The, New York, N. Y.
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening & Cutting
Fenn Manufacturing Co., The, Hartford, Conn.
Kilmer, M. D., & Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool Co., New Haven, Conn.
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Stanat Manufacturing Co., Long Island City, N. Y.
Wartenweiler, Emilio, Milano, Italy
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Stranding
Haskell-Dawes Machine Co., Philadelphia, Pa.
Hughesville Machine & Tool Co., Hughesville, Pa.
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Fenn Manufacturing Co., The, Hartford, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Hale & Kullgren, Inc., Akron, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Marshall-Richards Machine Co., Inc., Trenton, N.J.
Standard Machinery Co., Mystic, Conn.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

MACHINERY—Testing, Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Marshall-Richards Machine Company, Inc., Trenton, N. J.
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Tube Winders
Solomon, Michael, New York, N. Y.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y.
Solomon, Michael, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—for Wire Welding (See WELDERS—Butt and Spot)

MACHINERY—Winding Wire
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L., Co., Providence, R. I.
Federal Manufacturing Co., Wallingford, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply, Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Fenn Manufacturing Co., The, Hartford, Conn.
Hale & Kullgren, Inc., Akron, Ohio
Herborn Maschinenfabrik, Herborn, Germany
Marshall-Richards Machine Co., Inc., Trenton, N.J.
Morgan Construction Co., Worcester, Mass.
Morgardshammars Mek. Verkstads AB Morgadshammar, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Stanat Manufacturing Co., Long Island City, N. Y.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Wire Forming
Baird Machine Co., The, Stratford, Conn.
Kilmer, M. D., & Co., Cleveland, Ohio
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Angier Corporation, The, Framingham, Mass.
Marshall-Richards Machine C., Inc., Trenton, N. J.
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem, Rolling & Edging
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Co., Cleveland, Ohio

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling, John A. Sons Co., Trenton, N. J.
Wickwire Brothers, Inc, Cortland, N. Y.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Bedford, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

OVENS—Rod Bakers
Carl-Mayer Corp., The, Cleveland, Ohio
Michigan Oven Co., Detroit, Mich.
Morrison Industries, Bedford, Ohio

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Bedford, Ohio

PAINT—Acid Proof
Ceilcote Company, Cleveland, Ohio

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.
Solar Compounds Corp., Linden, N. J.

PAPER—Creped Wrapping
Angier Corporation, The, Framingham, Mass.
Arkell Safety Bag Co., New York, N. Y.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Angier Corporation, The, Framingham, Mass.
Arkell Safety Bag Co., New York, N. Y.
Terkelsen Machine Co., Boston, Mass.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS—(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PICKLING—Hooks, etc. Acid Resisting
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

PICKLING TANK LININGS—
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio

PIPES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio

PRESSES—Hydraulic and Mechanical
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Standard Machinery Co., Mystic, Conn.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio

REEL AND TENSION STANDS—
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Fidelity Machine Company, Inc., Philadelphia, Pa.
Industrial Ovens, Inc., Cleveland, Ohio.
Kilmer, M. D., & Co., Cleveland, Ohio
Roll-A-Reel, Cincinnati, Ohio.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

REEL CRUTCHES—
Roll-A-Reel, Cincinnati, Ohio
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Milton Machine Works, Inc., Milton, Pa.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
McCaskie, Inc., Wm., Westport, Mass.
North Anson Reel Co., No. Anson, Me.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
McCaskie, Inc., Wm., Westport, Mass.
Nelson Company, The, Baltimore, Md.
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L., Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp , Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Minn.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N.J.
Hamelin, J., Lumber & Woodwork, Ltd., Lachine, P. Q., Can.
Howsam Spool Co., Aurora, Ill.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
McCaskie, Inc., Wm., Westport, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Wooden
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Minn.
Hamelin, J., Lumber & Woodwork, Ltd., Lachine, P. Q., Can.
Nelson Company, The, Baltimore, Md.
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS— (See Ovens—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
American Brass Co., The, Waterbury, Conn.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Company, Pittsburgh, Pa.
Roebling's, John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
American Steel & Wire Company, Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's John A., Sons Co., Trenton, N. J

RUST PROOF COMPOUNDS—
(See Compounds—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See Compounds—Rust Preventing)

SALTS—Heat Treating, Descaling, etc.
Holden, A. F., Co., The, Detroit, Mich.

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.

SOAPS—Industrial and Wire Drawing
(See Compounds—Wire Drawing)

SODIUM—for Descaling
Holden, A. F., Co., The, Detroit, Mich.

SPOOLS—(See Reels & Spools)

SPOOLS—Stamped Metal for Retail Wire Sales
Clark, J. L. Mfg. Co., Rockford, Ill.
Mason Can Co., East Providence, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Art Wire and Stamping Co, Newark, N. J.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling's John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Pickling and Plating
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.
Heil Process Equipment Corp., Cleveland, Ohio

TESTERS — INSULATION (See MACHINERY—Spark Testers)

TESTING EQUIPMENT (See MACHINERY Testing, Physical)

TINNING PROCESS—
Metal & Thermit Corp., New York, N. Y.

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper, Silver and False Gold Coated, etc. (See TINSEL—Electric Conductor)

TOOLS—Wire Cutting
Porter, H. K., Inc., Somerville, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Machy—Power Transmission)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R.I.
Wire Insulating Machy., Inc., Manchester, Conn.

TUBE BENDERS AND FORMERS—
Kilmer, M. D., & Co., Cleveland, Ohio

TURKS HEADS—
Fenn Manufacturing Co., The, Hartford, Conn.

VALVES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VARNISHES—for Electric Wire
N. E. Lacquer Co., E. Providence, R. I.
Solar Varnish Corporation, Linden, N. J.

VULCANIZING PANS AND EQUIPMENT
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire Insulating Machy., Inc., Manchester, Conn.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

WIRE—Aluminum
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Malin & Co., Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, Ohio

WIRE—Barbed
Gerber, J., & Co., Inc., New York, N. Y.
Interlocking Fence Co., Morton, Ill.

WIRE—Brass
American Brass Co., The., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.

WIRE—Brush
Gerber, J., & Co., Inc., New York, N. Y.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's John A., Sons Co., Trenton, N. J.
Seneca Wire & Manufacturing Co., Fostoria, Ohio
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
American Brass Co., The, Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Gerber, J., & Co., Inc., New York, N. Y.

WIRE—Flat, Fine
Anchor Wire Corp., Jamaica, L. I., N. Y.
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Gerber, J., & Co., Inc., New York, N. Y.
Montgomery Co., The, Windsor Locks, Conn.

WIRE—Forming
Art Wire and Stamping Co, Newark, N. J.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.

WIRE—Galvanized
Gerber, J., & Co., Inc., New York, N. Y.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Continental Steel Corp., Kokomo, Ind.
Gerber, J., & Co., Inc., New York, N. Y.
Johnson Steel & Wire Co., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Newbury Co., The, Boston, Mass.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Co., Trenton, N. J.
Seneca Wire & Manufacturing Co., Fostoria, Ohio
U. S. Steel Co., N. Y., N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Music
American Brass Co., The, Waterbury, Conn.
American Steel & Wire Co., Cleveland, Ohio
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio
Newbury Co., The, Boston, Mass.
Seneca Wire & Manufacturing Co., Fostoria, Ohio
Specialty Wire Co., Inc., Worcester, Mass.

WIRE—Nickel Silver and Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Malin & Co., Cleveland, Ohio.
Chase Brass & Copper Co., Waterbury, Conn.

WIRE—Oil Tempered
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Spring
American Brass Co., The, Waterbury, Conn.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Gerber, J., & Co., Inc., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Newbury Co., The, Boston, Mass.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Manufacturing Co., Fostoria, Ohio
Specialty Wire Co., Inc., Worcester, Mass.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Specialty Wire Co., Inc., Worcester, Mass.
Wire Corporation, Worcester, Mass.

WIRE—Steel—Also Coppered and Galvanized Steel
Anchor Wire Corp., Jamaica, L. I., N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Manufacturing Co., Fostoria, Ohio
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Art Wire and Stamping Co., Newark, N. J.
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

WIRE—Tungsten
North American Philips Co., Inc., Allied Products Division, New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WRAPPING PAPER—Creped (See PAPER—Creped Wrapping)

YARNS & TAPES—
Glass Fibers, Inc., Toledo, Ohio

YARN TESTERS—
Heineman Corp., Oscar, Chicago, Ill.
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

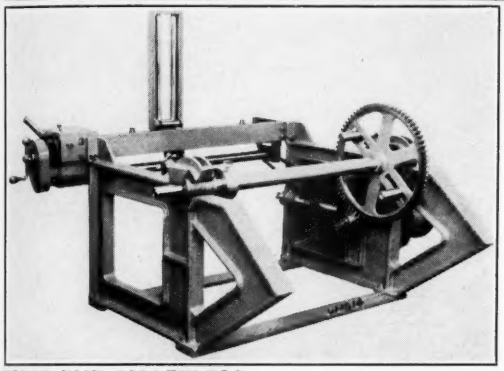
PATERSON 3, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE AND MASTICATING MACHINERY MANUFACTURERS

WATSON

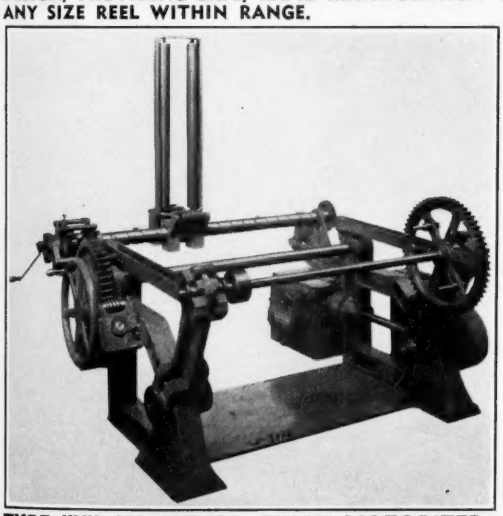
HEAVY DUTY TAKEUPS

AVAILABLE EITHER SEPARATELY OR WITH OUR EQUIPMENT, IN A VARIETY OF DESIGNS OF WHICH A FEW ARE SHOWN HERE.



TYPE "H" SHAFTLESS

No. W-3652 FOR 24" TO 50" DIA. REELS, 3 TON CAPACITY WITH D/40 TRANSMISSION AND TRAVERSE "RR". MODERATELY PRICED UNIT AVAILABLE IN THREE SIZES WITH HYDRAULIC LIFT, DRIVE ALWAYS IN MESH DESIGN, PROVIDING SAFE, RAPID MANIPULATION WITH ANY SIZE REEL WITHIN RANGE.



TYPE "V" SHAFTLESS, FULLY MOTORIZED

No. W-3050a FOR 72" DIA. 6 TON REELS WITH D/100 TRANSMISSION AND TRAVERSE "WR". DESIGN PROVIDES FOR SAFE RAPID REEL CHANGES. SIX AVAILABLE SIZES WILL LIFT FROM 36" TO 120" DIA. REELS DIRECTLY FROM FLOOR. THE SMALLEST HAS 6 TON, THE LARGEST 30 TON CAPACITY.

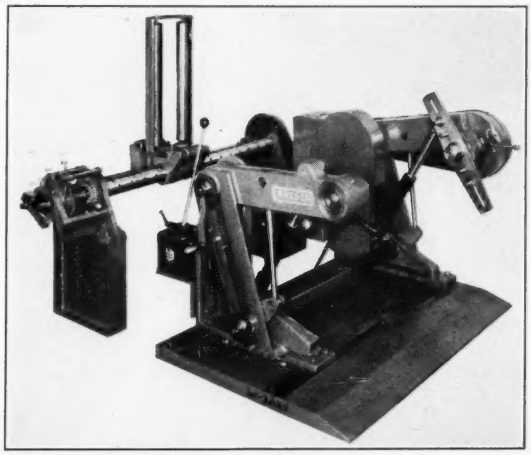
ALL UNITS ALSO AVAILABLE IN FOOT TREADLE, FOOT SWITCH OR HYDRAULIC FLOAT CONTROL MODELS.

★ ★ ★ ★ ★

Machine Bulletins Upon Request

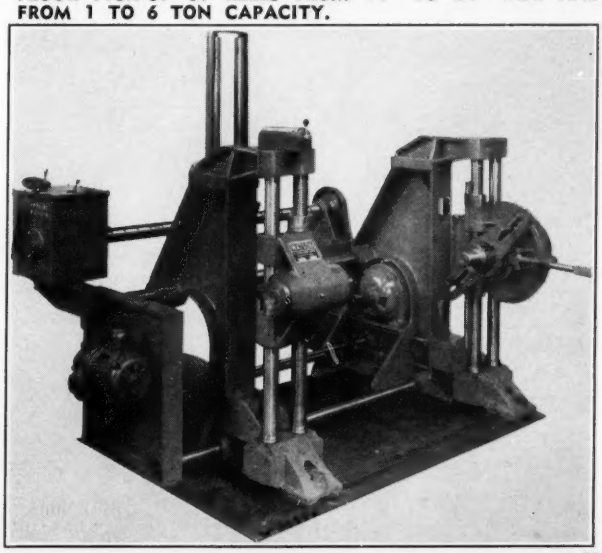
TYPE "I" INCLINE FRAME

No. W-1814 FOR 48" DIA. 2 TON REELS WITH MULTIPLE DISC SLIP FRICTION AND TRAVERSE "CR". HEAVY CONSTRUCTION AND FLEXIBILITY ALLOWS ADAPTION TO EXISTING EQUIPMENT. CYLINDER SWING REEL LOCK FACILITATES RAPID REEL LOADING AND UNLOADING. OFFERED IN FOUR SIZES.

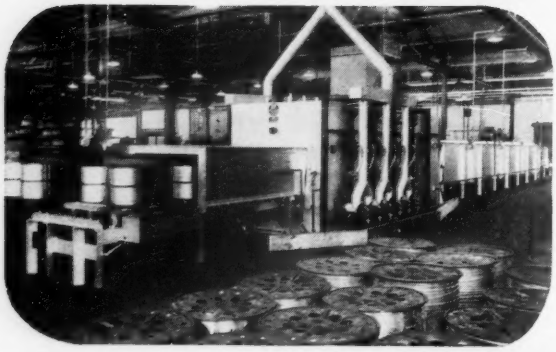


TYPE "W" MECHANICAL LIFT

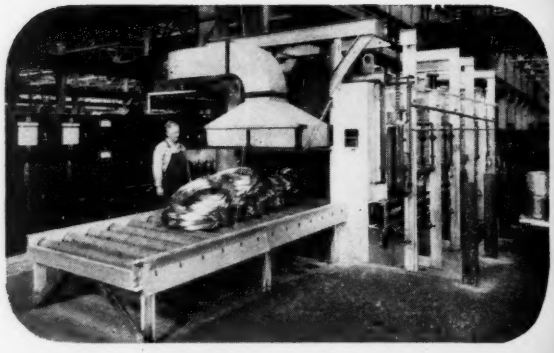
No. W-3126 FOR 60" DIA. 4 TON REELS WITH D/40 TRANSMISSION AND TRAVERSE "RR". POWERFUL, FREE-ACTING HANDWHEEL MECHANIZED UNIT. SIX SIZES PROVIDE FOR FLOOR PICK-UP OF REELS FROM 14" TO 84" DIA. AND FROM 1 TO 6 TON CAPACITY.



11-52

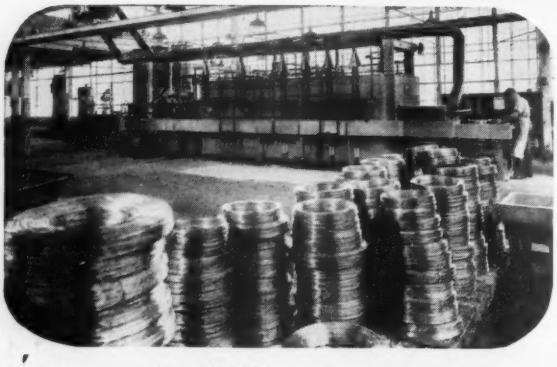


These combination electric and gas fired radiant tube bulkhead tray type furnaces are used extensively for bright annealing wire on reels and in coils.

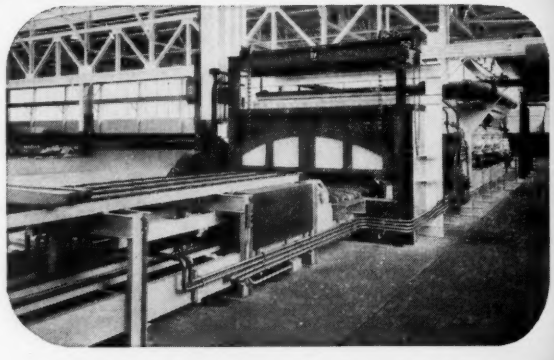


An EF gas fired three-chamber roller hearth with forced circulating system providing accurate temperature distribution, uniform finish and anneal—continuously.

INVESTIGATE EF DEVELOPMENTS



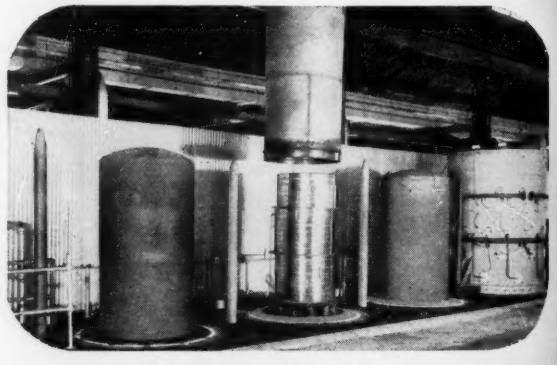
Clean annealing nickel-silver and other alloy wire in an EF gas fired radiant tube continuous roller hearth furnace. Handles coils up to 30" in diameter.



Wire bars up to 66" in length are uniformly and scale-free heated for rolling in this EF gas fired continuous pusher type furnace. Capacity 12,000 lbs per hour.

FOR EVERY Annealing, Heating or Heat Treating PROCESS

• We have made outstanding production installations for normalizing rod and bright annealing wire in coil, strands, on reels and spools; both ferrous and non-ferrous, including stainless — for heat treating bolts, springs and other wire products — for heating billets, wire bars, bluing nails and other heating and heat treating processes. We solicit your furnace inquiries



EF gas fired and electric hood, pit and other batch and continuous type furnaces are available for normalizing rod, annealing wire, strip and other processes.

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio

Canadian Associates • CANEFCO, LIMITED • Toronto 1, Canada